



**Geotechnical Assessment Report:
142 Konini Road, Titiranga, Auckland, 0604**

Hugh Johnstone

Project Reference: 24106

18th April 2025

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Project Information:

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| Document: | Geotechnical Assessment Report |
| Project Reference: | 24106 |
| Location: | 142 Konini Road, Titiranga, Auckland, 0604 |
| Legal Description: | Lot 1 DP 57907 |
| Proposal: | Proposed Extensions and Upgrades of an Existing Property |

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| 03 | Peter Walker | Detailed slope stability assessment updates | 18 th April 2025 |

Document Applicability:

This report has been prepared for the benefit of the contractually engaged client with respect to the particular brief given to us, and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement. If you require any further professional services or have any queries, please contact us.

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Table of Content

| | | |
|-------|--|----|
| 1 | Introduction | 5 |
| 1.1 | Scope | 6 |
| 1.2 | Proposed Development..... | 6 |
| 1.3 | Site Location and Description..... | 7 |
| 2 | Desktop Study | 8 |
| 2.1 | Summary of Desktop Reviews | 8 |
| 2.2 | Regional Geological Information | 9 |
| 3 | Geotechnical Investigation..... | 9 |
| 3.1 | Investigation Procedure | 9 |
| 3.2 | Ground Model | 9 |
| 3.3 | Ground Water and Natural Ground | 11 |
| 3.4 | Filling..... | 11 |
| 4 | Geotechnical Assessments..... | 11 |
| 4.1 | Summary of Geotechnical Assessments..... | 11 |
| 4.2 | Static Bearing Capacity | 12 |
| 4.3 | Static Settlement | 12 |
| 4.4 | Soil Site Reactivity..... | 12 |
| 4.5 | Site Seismic Subsoil Category | 13 |
| 4.6 | Slope Stability | 13 |
| 4.7 | Slope Stability Assessments..... | 13 |
| 4.7.1 | Existing Slopes and Site Features | 13 |
| 4.7.2 | Seismic Slope Stability Methods and Regularity Guidelines | 13 |
| 4.7.3 | Slope Stability Design Criteria | 14 |
| 4.7.4 | Slope Stability Results | 14 |
| 5 | Recommendations | 15 |
| 5.1 | Foundations, Retaining Walls and Slope Stability | 15 |
| 5.2 | Earthworks..... | 16 |
| 5.3 | Geotechnical Review of Drawings | 17 |
| 6 | Planning Considerations - Estimate of Excavation Works..... | 17 |
| 7 | Planning - Hazard Risk Assessment Information for the Existing Property Extensions | 18 |
| 8 | Required inspections..... | 19 |
| 9 | Report Limitations..... | 19 |
| 10 | Attachments..... | 19 |

11 References..... 20

Appendix A: Geotechnical Testing and LocationsA

Appendix B: Site Photos B

Appendix B.2: Ground Profile..... C

Appendix B.3: Slope Stability AssessmentsD

Appendix C: Selected Concept Drawings and Geological Profile Sections E

Appendix D: Hazard Risk Assessment Information - Existing Property Extensions..... F

1.1 Scope

The scope of this report includes:

1. A summary of investigations and assessments relevant to the specific site and proposed works.
2. Recommendations of the type of foundations and retaining required.
3. Confirmation that a general geotechnical review of the drawings illustrating the foundation and retaining specifications has been completed.
4. Provide estimates of anticipated excavation amounts.

1.2 Proposed Development

The proposed dwelling extension concept is shown in Figure 2. Figure 3 illustrates the current existing structures on the site. A new pool house and new pool, which includes a decking area, is proposed on the southern side of the existing building. The proposed new pool is to replace an existing pool. A new garage is proposed to replace the existing carport and storeroom, which is located on the northern side of the existing dwelling. The existing house is being extended in area to the south and as part of the extension the owner is proposing to replace and alter various building elements in the existing structure. The existing dwelling is founded on shallow reinforced concrete foundations. A timber retaining wall is proposed on the northern side to provide stability to the new garage. Other proposed new walls include the 1m offset timber wall from the pool, block-reinforced walls for the garage, and the wall supporting the proposed extension. The building components for the extensions and new works consist of lightweight timber framed flooring, timber walls, timber roofing, reinforced block walls and timber retaining walls. Structural elements include reinforced block walls, timber posts, timber beams, and various timber elements that integrate with the extensions. The majority of the site earthworks are expected to be limited to excavating down to the underside of the new garage foundations and the fill materials behind the proposed retaining walls.

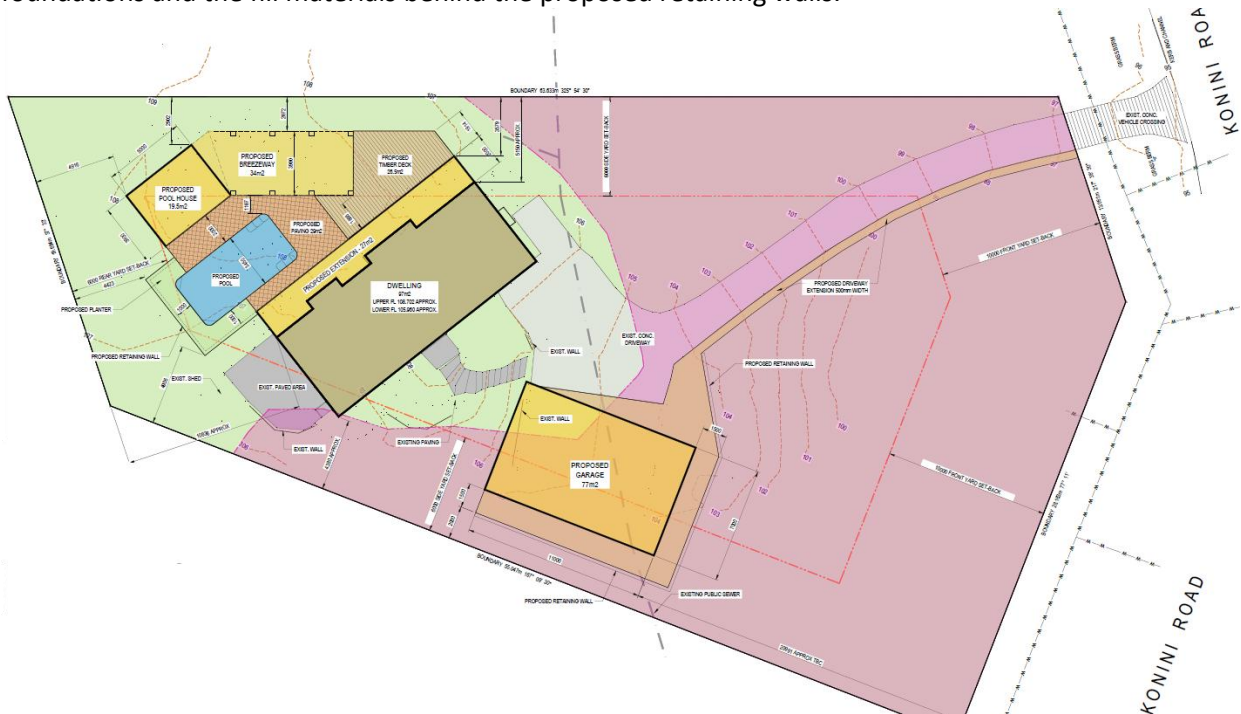


Figure 2: Proposed Building Footprint Extension

Geotechnical site-specific testing was completed for this site to confirm the suitability of the natural ground for this specific extension. For the purposes of our assessments, we have assumed that the proposed building structures are Importance Level 2 structures as defined by NZS1170.0:2002 Structural Design Actions Part 0 with a design life of 50 years.

1.3 Site Location and Description

The site is located at 142 Konini Road, Titiranga, Auckland, 0604 and is legally described as Lot 1 DP 57907.

The site consists of various existing structures, as illustrated in Figures 1 and 3. There is an existing driveway on the northeastern side that slopes up to the dwelling. The slope typically runs downwards from the south to the north direction. The existing dwelling is founded on a flattened-out area at the top of the slope.

The average slope is about 17% around the flattened-out dwelling area, and it varies between 1:6 and 1:3 gradients. It is clear that the ground is very stiff in the existing dwelling area, as physically observed in the below the basement existing foundations. The existing building was built in the 1950s. The plan is to retrofit the existing structure and extend it to make use of the open land areas. The intent of the new garage design is to provide better parking and a reduced driveway gradient into the property.



Figure 3: Existing Site

2 Desktop Study

2.1 Summary of Desktop Reviews

A desktop review study was conducted for the site to assess important features and possible relevance to the proposed works. The reviews included assessing GNS website, geotechnical testing on New Zealand's Geotechnical Database, the site's photos, the specific council's GIS map viewers, Google Earth Pro, and geotechnical maps of the area. Table 1 summarises the desktop review. Refer to the remaining chapter points for additional relevant items.

Table 1: Summary of Desktop Reviews

| Item | Comments Relevant to the Specific Site covering Natural hazards, Risks and Data |
|---|--|
| Previous geotechnical reports available | Not applicable. |
| Previous geotechnical testing available | Deep Borehole +/-500m from the site as per NZGD map data. Sandstone/siltstone/ East Coast Bays formation rock (ECBF) was recorded below 3m - 4m depths. Firm to stiff silts or Weathered Cornwallis Formation recorded below ground up until ECBF layers. |
| Flood Hazard | Not affected. |
| Minimum floor level & flooding | Standard floor levels are required as per NZS3604. |
| Inundation Restriction Levels | Not affected. |
| Active Faulting | Outside of known active fault zones. |
| Liquefaction risks | Factors that affect the potential for liquefaction include high groundwater level, soil type, relative soil density, initial confining pressure, and the intensity and duration of ground shaking. Soils most susceptible to liquefaction are loose, uniformly graded sands and, to a lesser extent, silty sands located below the groundwater level. The ground water table for this site is relatively deep, and Auckland area has a lower seismic acceleration compared to common liquefaction-prone areas. The proposed building site is underlain by at least 2.00 m of non-saturated stiff clay materials, which are considered to form a natural raft that suppresses the surface manifestation of liquefaction. In addition, there are underlying sandstone/siltstone layers that are not associated with liquefaction manifestations. Taking into account these significant factors, liquefaction risks are considered to be highly unlikely for this area. |
| Landslide Susceptibility | Not applicable. |
| Buried Services | There is a buried 100mm diameter wastewater pipe, as illustrated in Figure 1 that runs below the driveway and existing carport and connects with the existing public sewer line located to the northeastern side of the property. The existing pipe will need to be located during construction if excavating works occur in the area to assess depths and ensure the proposed retaining wall posts are positioned on each side of the service. There are water lines shown on the northeastern side of the property. |
| Other Possible Services | It is noted that there may be other existing services that are not defined on maps or drawings, which is always a possibility for an existing site of this nature, and the Contractor completing the works would need to excavate with caution. |

2.2 Regional Geological Information

The published regional geology¹ for the area is outlined in Figure 4.



Figure 4: Regional Geological Information based on Geological Maps (Leonard & al, 2010)

3 Geotechnical Investigation

3.1 Investigation Procedure

A site investigation was carried out by Walker Engineering Consultants on the 7th July 2024 which comprised of the following:

- A site walkover by a Chartered Geotechnical Professional Engineer.
- 3 x hand auger boreholes with shear vane testing and 4 x scala tests up to 4m depth.

A test location plan and the test data is provided in Appendix A.

3.2 Ground Model

The soil layers encountered on this site are typical of the areas surrounding the site and are consistent with the regional geology. A summary of the soil profile is provided in Table 2 and 3 below. The tables summarises the localised geotechnical testing so that the ground profiles can be considered for specific engineering designs.

¹ G. S. Leonard et al (2010). Geological Map 3, Geology of the Auckland, 1:250,000 scale, Institute of Geological and Nuclear Sciences.

Due to the soil's nature and depositional processes, the continuity of soil away from the test locations has been inferred and may vary from the assumed ground model. Refer to the geotechnical test results for further detailed descriptions of each test. As outlined in Appendix C, a ground profile has also been completed as part of the timber retaining wall designs near the driveway to illustrate the slope, retaining aspects and estimated ground layers.

Table 2: Soil profile summary* - HA1, SC1, HA2, SC2 – South Side of Property Near Pool Area

| Unit | Description* | Consistency / Relative Density | Depth to base of unit* (m) | Undrained shear strength converted from shear vane results (kPa) | DCP Blows per 100mm |
|-----------------------|--|---------------------------------|----------------------------|--|---------------------|
| Topsoil | Topsoil intermixed with SILTS, stiff, light grey, dry, fine to medium, low plasticity. | Stiff | 0.1 – 0.3 | 70 – 100 | 2 |
| Silts | SILT, clayey, reddish orange, stiff to very stiff, low to moderate plasticity, fine to medium. | Stiff to very stiff | 0.6 – 0.8 | 75 – 100 | 2 - 3 |
| Silts | SILT, clayey, reddish orange, very stiff, low to moderate plasticity, fine to medium. | Very stiff, Dense to Very Dense | 1 – 2.1 | 100– 135 | 3 – 10 |
| Siltstone / Sandstone | East Coast Bays Formation – Sandstone and Siltstone | Hard, Very Dense | 2.1 + | - | 5 - 12 |

Table 3: Soil profile summary* - HA4, SC3 - North Side of Property Near Retaining Wall Area

| Unit | Description* | Consistency / Relative Density | Depth to base of unit* (m) | Undrained shear strength converted from shear vane results (kPa) | DCP Blows per 100mm |
|-----------------------|--|---------------------------------|----------------------------|--|---------------------|
| Topsoil | Topsoil intermixed with SILTS, stiff, light grey, dry, fine to medium, low plasticity. | Stiff | 0.1 – 0.2 | 70 – 100 | 2 |
| Silts | SILT, sandy, stiff, orange with some sands, low plasticity, fine to medium. | Very stiff, Dense to Very Dense | 0.9 | 60 – 75 | 3 - 11 |
| Sands | SAND, dense to very dense, orange, fine to medium. | Dense to Very Dense | 2.8 | - | 4– 6 |
| Sandstone / Siltstone | East Coast Bays Formation – Sandstone and Siltstone - Weathered | Very Dense | 4 + | - | 8 - 12 |

*Note: Refer to the attached different hand augers results for further information for each log. Results vary slightly per test. ECBF layers are estimated based on surrounding data and tests completed and must be verified during construction.

3.3 Ground Water and Natural Ground

Groundwater was not observed in the actual hand auger holes completed down to a maximum of 2.8m. The rod of the DCP geotechnical tests was not moist or wet when extracting from the 4m depths. In addition, a hole was augered on site down to 4m at the garage area with no ground water observed. The site location was reviewed in detail to assess groundwater levels. It was noted that the site is high up on a hill and that a shallow ground water table is highly unlikely. A nearby deep borehole shows groundwater depths at around 6m depths, where the test was taken at RL 92, and for this specific site, geotechnical tests were taken from around RL 104 due to being on a hill. It is thus anticipated that the groundwater table will be very deep for this site (an estimation of > 9m below natural ground level).

Based on the geotechnical test results near the existing pool, the natural soil consists of stiff to very stiff silts below the topsoil layer (100mm to 200mm) and is suitable for founding foundations similar to NZS3604. The topsoil layer is organic and not suitable for founding. Near the lower driveway area, the soil tests were similar, but silts were more sandy, translating into a very dense sand layer located just about the weathered siltstone/sandstone as part of the East Coast Bay Formation layer. The upper silt layers at the lower driveway area have low plasticity due to the sandy conditions.

When excavating the natural ground for a new or extended building platform, it is important to anticipate the presence of lower-strength soils or those that may experience a loss of strength when disturbed by earthmoving equipment due to their sensitivity. These soils could be encountered during construction; thus, construction monitoring and ground-bearing tests at subgrade levels are essential.

3.4 Filling

The site may involve excavation and filling operations, along with the essential placement of a compacted fill layer beneath certain foundations. The final subgrade level may need to be reviewed at construction and tested if considered a requirement by the Engineer to confirm “good ground” ultimate bearing capacity conditions as per NZS3604.

4 Geotechnical Assessments

4.1 Summary of Geotechnical Assessments

Geotechnical assessments were completed for this site to cover various items, as summarised in Table 4. Certain items have been further explained in the following sections.

Table 4: Summary of Geotechnical Assessments

| Item | Comments Relevant to the Specific Site |
|------------------------------|---|
| Ultimate Bearing Capacity | >300kpa ultimate bearing capacity is applicable below topsoil depths. |
| “Good ground” as per NZS3604 | “Good ground” criteria as per NZS3604 is thus applicable below topsoil depths due to ultimate bearing capacity meeting the code’s requirements. |
| Liquefaction Risks | Not applicable. |
| Lateral Spreading Risks | Not applicable. |
| Stormwater Assessments | Refer to the separate stormwater report and associated stormwater management specifications. |

| | |
|------------------------------------|--|
| Cyclic Softening Risk | Not applicable. |
| Slope Stability Risk | The site is stable, and the proposed extensions will be in relatively flat areas near the pool. At the garage location, a timber retaining wall has been designed to increase the stability of the garage area. The retaining wall will consider the slopes, ground and existing features. Previously, there were no retaining walls at this location, so the layout will greatly improve the stability. |
| Expansive Soils | Class M soil types as a conservative measure for near the pool areas, as outlined in the below sections. |
| Potentially compressible soils | Not applicable due to foundations founded on very stiff materials. |
| Governing Criteria for Foundations | Specific engineering designs will likely govern in certain areas due to higher concentrated loads. Certain designs will need to consider depths, Class M conditions and loading criteria. |

4.2 Static Bearing Capacity

NZS3604:2011 Timber Framed Buildings definition of “Good Ground” requires soils to be capable of permanently withstanding a minimum Geotechnical Ultimate Bearing Capacity (GUBC) of 300 kPa below the proposed foundations. Allowable Bearing Capacity of 100 kPa for a Factor of Safety of 3 is typically applicable to limit settlements to a maximum of 25mm.

For cohesionless soils, the New Zealand Building Code requires 5 blows per 100mm down to a depth of twice the footing width or 3 blows per 100mm at greater depths to establish ‘Good Ground’ in terms of bearing capacity. For cohesive soils, a GUBC of 300kPa is indicated by soils with a minimum undrained shear strength of 60kPa.

The topsoil layer encountered during the site investigation of the extension areas is not suitable to support foundations due to the presence of organics. Stiff to very stiff cohesive silt materials are applicable below the topsoil layer with undrained shear strength S_u values of 60 to 135kpa (converted from shear vane results). The material below the topsoil layer thus equates to GUBC of above 300kpa. NZS3604 foundation types thus may be used for the extensions of the layout where loading is within NZS3604 criteria. For shallow foundations, the top organic layers will need to be removed and replaced with compacted fill. Founding depths will require confirmation during construction, and certain foundations may need to be deeper to cater for Class M conditions, such as near the pool area.

4.3 Static Settlement

For foundations designed to the geotechnical ultimate bearing capacity values provided above, static elastic settlements are expected to be limited to 25mm between concentrated foundation supports due to maximum allowable bearing pressures of 100kpa associated with NZS3604.

4.4 Soil Site Reactivity

In the absence of laboratory testing and as per the client brief, we have assessed the site near the pool area as a Class M soil reactivity type in accordance with AS 2870, Table 2.1,2.2 and NZS3604, Section 17. The measure is conservative and safe as some of the deeper-lying soil has a low to medium plasticity. Through the physical inspection of the existing building foundations and the geological nature, the soil

type did not appear to be reactive. However, a conservative approach is the safest and can be easily integrated into the designs to consider future droughts for the full design life of the proposed pool dwellings. The soil in the garage area was low in plasticity, sandy, and had fill; thus, soil reactivity will be lower, and standard foundations are acceptable at that location.

4.5 Site Seismic Subsoil Category

In the absence of deeper testing, we have assessed the site as a Class C in accordance with NZS 1170.5, Section 3.1.3, which is appropriate for the area.

4.6 Slope Stability

There will be some minor cuts and fills near the existing pool area for the new timber and block retaining walls, providing stability to the areas. For the lower garage area, the existing driveway level is being cut down by up to 1m, thus reducing the slope gradients. The ground conditions have high strengths in this area as per the geotechnical test results and ground profile shown in Appendix C, and thus, the existing slope didn't show signs of any movements or slips. In addition, a timber retaining wall has been specified to increase overall stability. The wall has been designed for a high retaining height and a front slope of 1: 3 or 18.4 degrees to ensure overall stability. Drainage fill is specified behind the new wall, which will better manage the runoffs in the area. Weep holes specified in the timber retaining wall ensure any water entrapment behind the wall gently trickles out, avoiding pore water pressure build-up after storm events. The additions will thus improve the site's overall stability.

4.7 Slope Stability Assessments

4.7.1 Existing Slopes and Site Features

The site's existing slopes and general site features are shown in Figures 1 and 3 in plan view with an outline of the existing carport area and surrounding dense vegetation down the slope. Photographs in Appendix B further illustrate the nature of the vegetation. Drawings in Appendix B.2 show a cross section through the existing slope and the proposed changes.

4.7.2 Seismic Slope Stability Methods and Regularity Guidelines

The council have requested a detailed slope stability assessment of the slope to substantiate that the slope will be stable post-development. A site-specific geotechnical investigation, detailed cross-section profile, and detailed photographs of the site features were used to carry out the slope stability assessment. The existing slope below the building platform shows no signs of movement, contains dense vegetation at the toe. A detailed slope and geological profile is shown in Appendix B.2, indicating items to scale, and demonstrating the geotechnical tests, topographical survey, and the proposed new works. Slope stability analysis assessments are shown in Appendix B.3. The general concept is a safe design approach to ensure general slope strengthening, as the retaining wall piles have been designed for the surrounding slopes.

In addition, a slope stability assessment was completed using well-known engineering principles and methods, recognised software, and New Zealand's codes and standards. Software was used to model the slope under existing conditions, the proposed updated design and suggested engineering solutions to ensure slope stability. Various load cases and conditions were modelled with different design parameters. Engineering methods used in the assessment include the following:

- MBIE NZ Module 1 - 6: Earthquake Geotechnical Engineering Practice Guidelines
- NZGS Slope Stability Geotechnical Guidance Series
- Pseudo-Static and Wedge Design Methods
- Software using Morgenstern – Price method of slices.
- The model's materials were defined using Mohr-Coulomb principles.
- FHWA Pub. GEC No. 3, Vol. 1 and Noda et al. methods (1975) to correlate relationships between peak ground acceleration (amax) and the seismic coefficient (kh).
- Ambraseys, Franklin & Chang, and Bray & Travasarou Methods to assess earthquake-induced displacements of the slope.

4.7.3 Slope Stability Design Criteria

The most significant design assumptions implemented include the following:

- Assumes that the slope will behave in a 2-D manner.
- Assumes that the ground conditions are homogeneous and consistent as per the data.
- Assumes a maximum fill thickness equivalent to 10kpa on top of the existing building platform behind the retaining walls and that the new garage is 1.5m away from the wall, thus keeping the garage's surcharge to 10kpa.
- Assumes that the seismic assessment parameters are as outlined in the 2021 MBIE (Table A.1).
- A kh seismic value of 0.19 has been used as the input parameter in the slope stability model as a conservative upper bound parameter, which aligns with NZGS Module 1.
- Geotechnical parameters used as outlined in Table A.2, which are typically lower bound values compared to the existing report and geotechnical data found.

Table A.1: Seismic Parameters

| Design Life (years) | Importance Level | Earthquake Magnitude, Mw | Seismic Event | Return Period Factor | Annual Probability of Exceedance | Peak ground Acceleration, PGA (g) |
|---------------------|------------------|--------------------------|---------------|----------------------|----------------------------------|-----------------------------------|
| 50 | 2 | 6.5 | SLS | 0.25 | 1/25 | 0.07 |
| | | | ULS | 1.0 | 1/500 | 0.19 |

Table A.2: Soil Parameters for Slope Design Purposes

| Unit | Effective friction angle (°) | Unit weight (kN/m ³) | Effective cohesion(kPa) | Normal Pore Water Pressure Ratio (R) | Transient Pore Water Pressure Ratio (R) | Undrained Shear Strength(kPa) |
|---------------------|------------------------------|----------------------------------|-------------------------|--------------------------------------|---|-------------------------------|
| Silts | 31 | 17* | 3* | 0.1* | 0.3* | 50 |
| Sands | 32* | 18* | 0* | 0.1* | 0.3* | - |
| Sandstone/Siltstone | 34* | 19* | 5* | 0.1* | 0.3* | - |

*Note: Completed sensitivity checks in the designs and used lower bound values where suitable.

4.7.4 Slope Stability Results

Slope stability assessments included the modelling of the slopes under various scenarios, as summarised in Table 5. As illustrated in Appendix B.3, assessment outputs have been completed, which demonstrate the appropriate safety of factors being achieved under various load cases. The method for assessing the slope is conservative to cater for variable scenarios. Engineering commentary has been provided, and safety factors have been reviewed, as indicated in Table B.

Displacement estimates under the major seismic event for the slip planes are negligible based on correlations of the slope's yield acceleration. Minor displacements are typically acceptable; however,

they are not relevant in this case, which indicates a very stable slope. The slope stability outputs for the post-development case consider the timber retaining wall poles, which increase stability under the larger fill loadings near the wall. The retaining poles have been designed for the associated slope geometry and loads, as well as per previous designs provided, where each pole can withstand 50 kn lateral forces. The outputs demonstrate that the existing slope would remain stable under the increased building and fill pressures.

Table B: Summary Results of Slope Stability Analysis – Morgenstern – Price Method

| Load Case Number and Condition | Pore Water Pressure Ratio (R) | Long Term Surcharge load (Kpa) | Seismic Event | Design Criteria Required | Minimum Slope Factor of Safety Outputs | Engineer's Comment |
|---|-------------------------------|--------------------------------|---------------|--------------------------|--|--------------------|
| C1 – Pre Development – Static Long-Term Conditions - Normal | R = 0.1 throughout | 10 | - | 1.5 | 1.52 | Stable |
| C2 – Pre Development – Static Long-Term Conditions - Transient | R = 0.3 throughout | 10 | - | 1.2 | 1.18 | Stable |
| C3 – Pre Development – Normal – Seismic Conditions | R = 0.1 throughout | 10 | ULS,1/500 | 1 | 1.03 | Stable |
| C4 – Post Development – Static Long-Term Conditions - Normal | R = 0.1 throughout | 10 | - | 1.5 | 1.76 | Stable |
| C5 – Post Development – Static Long-Term Conditions - Transient | R = 0.3 throughout | 10 | - | 1.2 | 1.37 | Stable |
| C6 – Post Development – Normal – Seismic Conditions | R = 0.1 throughout | 10 | ULS,1/500 | 1 | 1.16 | Stable |

5 Recommendations

5.1 Foundations, Retaining Walls and Slope Stability

The following recommendations are to provide a suitable foundation for the proposed works, which minimises geotechnical risks identified to an acceptable level. Recommendations include the following:

1. A geotechnical safe bearing capacity of 100kPa (geotechnical ultimate bearing capacity of 300kPa) which is equivalent to NZS3604 criteria, may be adopted for the proposed foundations.
2. Topsoil must be replaced with compacted granular fill or ignored for the pile designs.
3. The current proposed new foundations include the new garage foundations, foundations for the existing building changes, the new pool foundations and foundations for the new structures near the pool.
4. It is recommended that foundations are founded a minimum of 600mm below natural ground level to mitigate soil effects associated with Class M soil materials for the new pool structures. The proposed foundations specified for the proposed basement are considered suitable for the soil conditions.
5. The garage foundations near the driveway may include shallow concrete foundations where a concrete waffle slab foundation would safely meet the ground criteria. After excavation of the driveway below the garage, the natural ground and fill must be reviewed by the Engineer to verify ground bearing capacity.
6. Piles must be founded at a minimum of 0.6m depth below natural ground level for the NZS3604 ordinary piles and 0.9m depth for anchor pile types. The extra depths are to ensure resistance against Class M soil types and to ensure bearing capacity of over “good ground” conditions as per NZS3604. The final depth must be inspected prior to concrete pouring.

7. The construction of the piles should be carried out using appropriate methods for clayey silt conditions. Piles should be dry and free of loose material immediately before pouring concrete.
8. The retaining wall, specific design foundations and associated structural aspects are to be designed by a Chartered Professional Engineer in accordance with NZ Building Code Verification Methods and can consider the below-ground parameters or interpolate from the geotechnical test results provided.

Loose to Medium-dense sands – For Fill or Insitu Ground:

Bulk unit weight: 17kN/m³

Effective friction angle: 32°

Relative density: $R_d < 40\%$

Soft to Firm Clay – For insitu Ground:

Bulk unit weight: 16kN/m³

Undrained Shear Strength: 60kpa

Adhesion Factor: 0.6

9. It is noted that the existing driveway is being lowered slightly, and the parking areas are being extended. Through reviews, cutting down the existing driveway and adding timber retaining walls with designed pole embedments will provide overall stability to the site. The cut platform will reduce the existing ground and the driveway slope and the higher-strength soils will be higher up in the soil platform, thus making it a suitable and stable proposed extension.
10. Slope stability assessments, making use of the latest costs, the site features and geotechnical testing data, demonstrate that the current proposal would result in a stable slope. This is evident in the slope stability assessment results, which achieve global slope stability outputs above the building code requirements. It is noted that the garage near the driveway should not be placed within 1.5m of the proposed new timber retaining wall to ensure surcharge loads are appropriate. Planting vegetation up the slope below the proposed retaining walls is recommended to provide natural slope strengthening.
11. For the timber retaining wall near the garage, specific engineering designs are required by a Chartered Professional Engineer to consider the gradients and specific ground conditions that increase in strength with depths. It is recommended that the piles be augered into the silt/sandstone layers with a minimum of 3 x diameter of the specified concrete pile. Engineering designs have been completed for this critical retaining wall as per the attached engineering drawings and separated design engineering documentation (PS1, design report and calculations).

5.2 Earthworks

The site earthworks shall be carried out in accordance with NZS 4431 *Code of Practice for Earth fill for Residential Development*. Important recommendations include the following:

1. All topsoil and unsuitable materials shall be stripped from the building platform to at least 600mm beyond the footprint of the proposed new concrete foundation slab. Pumice sand or an alternative fill material should be placed and compacted in layers of no greater than 200mm to form a level building platform.
2. Any fills greater than 600mm in depth should be tested and certified by a Chartered Professional Engineer familiar with the recommendations of this report. Inspection of the subgrade following removal of topsoil and testing of the backfill shall form minimum requirements for certification.
3. Between April and September, it's important to factor in the impact of rainy conditions that could potentially compromise the strength of cohesive fill. Earthworks should be scheduled during dry

weather, postponed until the summer season, or alternatively have gravel or pumice sand fill substituted for cohesive fill.

- The gradients of slopes created during on-site excavation must adhere to the specifications outlined in the table below. These slopes should be shaped in a manner that maintains a minimum distance of 2.5m from any downhill structures, unless retaining measures are employed.

Table 5: Maximum permissible batter angles.

| Batter Height | Cut | Fill |
|---------------|---------|-------|
| <1.5m | 1H:1V | 2H:1V |
| 1.5 – 2.5m | 1.5H:1V | |
| >2.5m | 2H:1V | |

5.3 Geotechnical Review of Drawings

A geotechnical review of the drawings has been completed to assess the finalised proposed foundations and retaining aspects of the extensions. Various retaining and foundation elements has been designed by a Chartered Professional Engineer. The proposed structures for the pool dwelling are founded on piles similar NZS3604 but with greater depths to satisfy the conditions of this report. For the basement side, foundations include a concrete reinforcement slab with concrete foundation beams at certain intervals. The garage slab includes a concrete waffle slab. The new pool has a foundation specification to consider expansive soils as a conservative manner. Timber retaining and block wall retaining have been designed accordingly. The timber wall near the driveway extends deep into the harder ground layer, providing general stability for the area. The block wall foundation pads are large enough to consider various load cases and the client’s requirements. Drawings have been reviewed in detail, and design calculations have been carried out to assess the various specific design components as per the design package provided separately. The current foundation and retaining specifications are considered suitable for the ground and overall site conditions.

6 Planning Considerations - Estimate of Excavation Works

The planning team has requested an estimate of the excavation areas and volumes required for the new site proposals to support consent planning. A detailed review was completed using the drawings outlining the existing structures, concept drawings showing the proposals and the topographical survey data. Engineering drawings in Appendix C illustrate the approximate excavation volume required, particularly in the driveway area, which represents the majority of the excavation. Table 6 summarises the estimated excavation volumes and plan areas.

Table 6: Summary of Pre-development & Post-development Areas – Excavation Specific

| Site Coverage Areas | Excavation for Extension Plan Areas (m2) | Excavation Total Volume due to cut below Extension Areas (m3) |
|---|--|---|
| Lower Area - Driveway Extension | +15 | +5 |
| Lower Area - Garage Area | +168 | +136 |
| Lower Area - Retaining Poles | +5.3 | +11.7 |
| Upper Area – Block Wall Extension | +27 | +56 |
| Upper Area – Pool Dwelling Currently Estimate Based on Standard Piles | +8 | +17 |
| Totals: | +223 | +226 |

Note: Values are approximate based on the information provided

A detailed review of the affected vegetation areas was also completed, as outlined in Table 7. The table illustrates the areas utilised for new extensions compared to the existing vegetation areas affected by these developments. For the new versus existing stormwater impermeable and permeable areas and proposed stormwater upgrades, refer to the submitted Stormwater Report submitted separately from this report. The tables indicate the relatively small nature of additions and can be considered for planning purposes. It is noted that these values are estimates based on the current information and may vary with future changes; refer to the latest drawings for accuracy.

Table 7: Summary of Pre-development & Post-development Areas – Loss of Vegetation Area Specific

| Site Coverage Areas | Vegetation Area used for New Extensions (m2) | Garden Area near Pool used for New Extensions (m2) | Existing Dwelling/Paving/Pool Areas used for New Extensions or Replacements (m2) |
|---|--|--|--|
| Lower Area - Driveway Extension | +15 | 0 | 0 |
| Lower Area - Garage Area | +58 | 0 | +74 |
| Upper Area – Pool Dwellings | 0 | +55 | +28 |
| Totals: | +68 | +55 | +102 |
| <i>Note: Values are approximate based on the information provided</i> | | | |

Further reviews of the amount of the cut and fill were carried out as outlined in the site earthworks plan Drawings (Sheet ISO), which has been completed for planning purposes. The plan and reviews consider the earthworks within and outside the Strategic Environment Assessment (SEA) area. Table 8 below provides a summary of the findings.

Table 8: Summary of Earthworks – SEA Specific Area Reviews

| Earthwork Type: | Earthworks Outside of SEA (m3) | Earthworks within SEA, but outside of existing Driveway & Vehicle Forecourt Formation(m3) | Earthworks within the SEA and within existing Driveway & Vehicle Forecourt Formation (m3) | Total Earthworks: (m3) |
|---|--------------------------------|---|---|------------------------|
| Cut: | 148 | 38 | 40 | 226 |
| Fill: | 0 | 35 | 0 | 35 |
| <i>Note: Values are approximate based on the information provided</i> | | | | |

7 Planning - Hazard Risk Assessment Information for the Existing Property Extensions

A hazard risk assessment was carried out as per Section E36.9 of the Auckland Unitary Plan Operative (AUP) as outlined in Appendix D. The assessment provides information for planning, mitigations of risk methods, construction and environmental considerations.

8 Required inspections

The following inspections are required for the engineered ground items outlined above:

1. Visual inspection of the building platform excavated to the base. This includes the garage foundations, basement foundations, retaining foundations and pool structures foundations.
2. Inspection and ground certification of compacted fill under the foundations and up against the retaining walls where applicable.
3. Retaining wall inspections after cutting ground and before placing drainage elements.
4. The foundation set out must be inspected prior to concrete pouring.
5. Pile holes and associated depths are to be inspected prior to pouring concrete.
6. Timber lagging and drainage reviews prior to backfilling.
7. Required quality documents for reviewing include:
 - a. Evidence of pile depth records is to be provided.
 - b. Evidence of the implementation of the required drainage metal and subsoils.
 - c. Completion of PS3, further quality documents from the Contractor.

All pile excavations should be dry and free of loose material immediately before concrete is poured. If the site conditions change due to rainfall, over-excavation, etc. WECL should be contacted for reinspection prior to the placement of concrete. All inspections must be carried out by a suitably qualified professional to grant the PS4 certificate

9 Report Limitations

This report and recommendations have been prepared by Walker Engineering Consultants Limited to complete the agreed scope as outlined above. The recommendations in this report do not supersede recommendations of other engineering reports and shall be considered in conjunction with all other information available for the site. Should you have any doubts about the recommendations of this report, it is essential that you discuss these issues with Walker Engineering Consultants prior to proceeding with any work based on this report. Testing portrays a limited percentage of ground conditions at this site and may not be representative of all soils present on site. During excavation and construction, the site should be examined by a suitably qualified engineer in order to assess whether the exposed subsoils are compatible with the inferred soil conditions on which the recommendations have been based and potentially, further investigation and design rationalisation may be required. Inspections and engineering reviews are essential during construction, as specified in this document. These steps should be undertaken as part of the construction monitoring phase to obtain the final engineering approval, which is indicated by the Producer Statement 4 document. This document is vital for meeting the code of compliance standards.

10 Attachments

Please refer to the below relevant appendix attachments that form part of the report documentation. The attachments can be found either embedded in this report or saved separately as per the council's consenting requirements or as per the external party's updated documentation.

11 References

- Bowen, H. J. (2013). *Liquefaction induced ground damage in the Canterbury earthquakes: prediction vs. reality*. Queenstown: 19th NZGS Geotechnical Symposium.
- Henderson, D. (2013). *The performance of House Foundations in the Canterbury Earthquakes*. Christchurch: Department of Civil and Natural Resources Engineering, University of Canterbury.
- Ishihara, K. (1985). Stability of natural soil deposits during earthquakes. International Conference on Soil Mechanics and Foundation Engineering.
- Leonard, G. S., & al, e. (2010). *Geological Maps*. Institute of Geological and Nuclear Sciences.
- MBIE. (2012-2015). *Repairing and rebuilding houses affected by the Canterbury earthquakes, Part A - E Technical Guidance*. Ministry of Business, Innovation & Development .
- MBIE. (2021). *AS/VM B1 - Acceptable Solutions and Verification Methods for New Zealand Building Code Clause B1 Structure*. Ministry of Business, Innovation & Employment (MBIE).
- MBIE. (2021). *Earthquake Geotechnical Engineering Practice: Module 1 - 6*. New Zealand Geotechnical Society (NZGS) and Ministry of Business, Innovation & Employment (MBIE).
- Standards New Zealand. (2011). *New Zealand Standard: NZS3604 : 2011 Timber – framed buildings*.
- Stockwell, M. (1977). *Determination of allowable bearing pressure under small structures*. . New Zealand Engineering Vol. 32, Iss. 6, dated 15 June 1977.
- Tonkin & Taylor. (2013). *Liquefaction Vulnerability Study. Canterbury: Earthquake Commission*. Tonkin & Taylor Ltd.

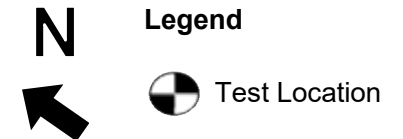
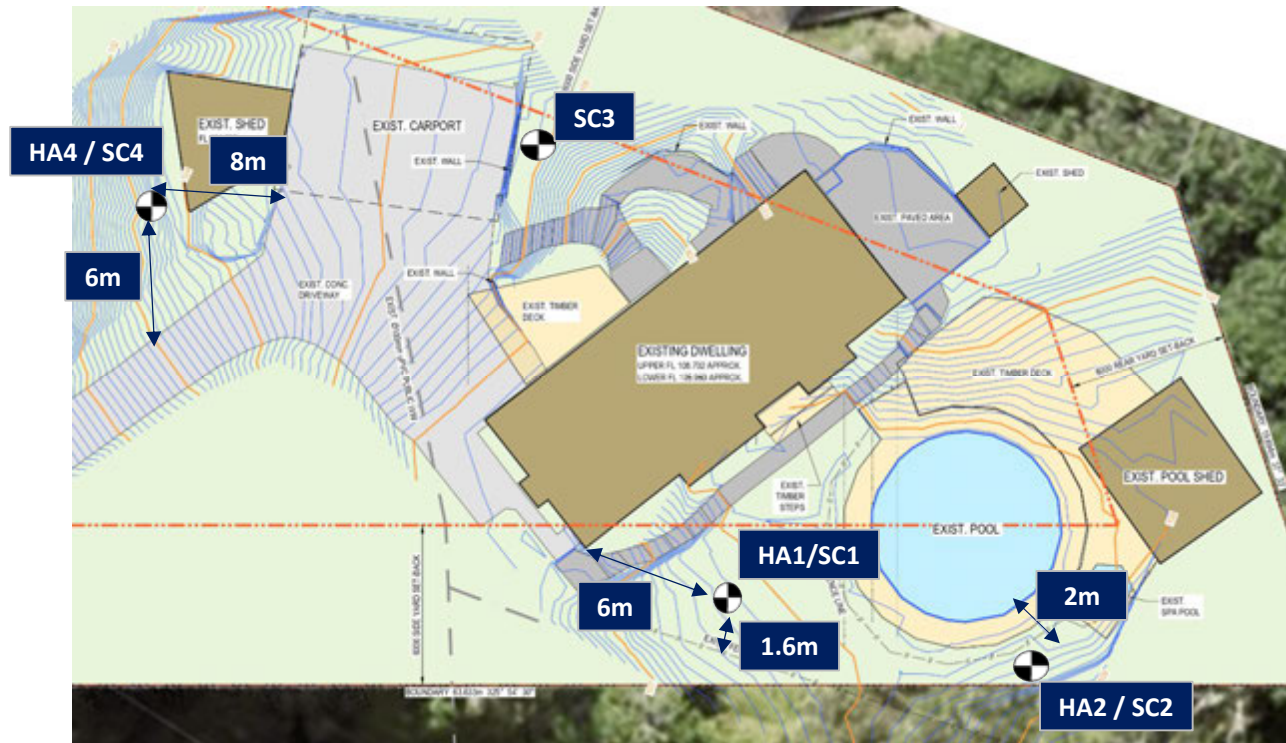
Appendix A: Geotechnical Testing and Locations

TEST LOCATION PLAN



Project: Geotechnical investigations
Location: 142 Konini Road, Auckland
Client: Hugh Johnstone

Project No.: 24106
Revision: 1
Prepared By: PW



Notes:

- 1 Test locations are indicative only.
- 2 Basemap: As built drawings.

| | | |
|--|---------------------------------|---|
| <h1 style="margin: 0;">BOREHOLE LOG</h1> | <h1 style="margin: 0;">HA1</h1> | <p style="margin: 0; font-weight: bold;">WALKER ENGINEERING CONSULTANTS</p> |
| <p>Project: Geotechnical investigations Location: 142 Konini Road, Auckland Project No.: 24106 Client: Hugh Johnstone</p> | | |

| | | |
|---|--|---|
| <p>Drill Type: Hand Auger - 50mm Drilled by: PW Logged by: PW Date: 7/7/2024</p> | <p>Coordinates: <i>See test location plan</i> Relative Level (Moturiki):</p> | <p>Logged in accordance with FIELD DESCRIPTION OF SOIL AND ROCK.Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes.NZ Geotechnical Society Inc.19mm Shear Vane with shear vane conversions applied.</p> |
|---|--|---|

| Depth (m) | G.W. Level | Graphic Log | Soil Description (strength/density - fraction - colour - structure - moisture - bedding - plasticity - sensitivity - additional) | Depth (m) | Shear Vane (kPa) | Scala Penetrometer (blows/50mm) |
|-----------|------------|-------------|---|-----------|------------------|---------------------------------|
| 0.0 | | | TOPSOIL intermixed with clayey silts and sands | | | 0 1 2 3 4 5 6 7 8 9 10 |
| | | | SILT - clayey - light grey - occasional organics - firm to stiff. | 0.30 | 70 | |
| 0.5 | | | | 0.60 | 65 | |
| 1.0 | | | | 0.90 | 60 | |
| 1.5 | | | SILT - clayey - reddish orange - stiff to very stiff - low to moderate plasticity - fine to medium. | 1.20 | 90/60 | |
| | | | End of borehole at 1.5m bgl - UTP. | 1.50 | 90/60 | |
| 2.0 | | | | | | |
| 2.5 | | | | | | |
| 3.0 | | | | | | |
| 3.5 | | | | | | |
| 4.0 | | | | | | |

Notes: No free groundwater observed.

| | | | | | | | | | | | | |
|--|----------|----------|------|------|------|------|------|------|--------|---------------------------|---------------------------|--|
| <p>Legend:</p> <table style="display: inline-table; border: none;"> <tr> <td style="padding: 2px;"></td><td style="padding: 2px;">Organics</td> <td style="padding: 2px;"></td><td style="padding: 2px;">Clay</td> <td style="padding: 2px;"></td><td style="padding: 2px;">Silt</td> <td style="padding: 2px;"></td><td style="padding: 2px;">Sand</td> <td style="padding: 2px;"></td><td style="padding: 2px;">Gravel</td> <td style="padding: 2px;">UTP = Unable to Penetrate</td> </tr> </table> | | Organics | | Clay | | Silt | | Sand | | Gravel | UTP = Unable to Penetrate | <p>Reviewed: PW Date: 10/30/2024</p> |
| | Organics | | Clay | | Silt | | Sand | | Gravel | UTP = Unable to Penetrate | | |

| | | |
|--|---------------------------------|---|
| <h1 style="margin: 0;">BOREHOLE LOG</h1> | <h1 style="margin: 0;">HA2</h1> | <p style="margin: 0;">WALKER ENGINEERING CONSULTANTS</p> |
| <p>Project: Geotechnical investigations Location: 142 Konini Road, Auckland Project No.: 24106 Client: Hugh Johnstone</p> | | |

| | | |
|---|--|---|
| <p>Drill Type: Hand Auger - 50mm Drilled by: PW Logged by: PW Date: 7/7/2024</p> | <p>Coordinates: <i>See test location plan</i> Relative Level (Moturiki):</p> | <p>Logged in accordance with FIELD DESCRIPTION OF SOIL AND ROCK.Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes.NZ Geotechnical Society Inc.19mm Shear Vane with shear vane conversions applied.</p> |
|---|--|---|

| Depth (m) | G.W. Level | Graphic Log | Soil Description (strength/density - fraction - colour - structure - moisture - bedding - plasticity - sensitivity - additional) | Depth (m) | Shear Vane (kPa) | Scala Penetrometer (blows/50mm) |
|-----------------------------------|------------|-------------|---|-----------|------------------|---------------------------------|
| 0.0 | | | TOPSOIL intermixed with clayey silts and sands | | | 0 1 2 3 4 5 6 7 8 9 10 |
| 0.5 | | | SILT - clayey - reddish orange - stiff to very stiff - low to moderate plasticity - fine to medium. | 0.30 | 50 | |
| End of borehole at 0.6m bgl - UTP | | | | | | |
| 1.0 | | | | | | |
| 1.5 | | | | | | |
| 2.0 | | | | | | |
| 2.5 | | | | | | |
| 3.0 | | | | | | |
| 3.5 | | | | | | |
| 4.0 | | | | | | |

Notes: No free groundwater observed.

| | | | | | | | |
|--|----------|------|------|--------|---------------------------|---------------------------|--|
| <p>Legend:</p> <table style="width: 100%; font-size: small;"> <tr> <td> Organics</td> <td> Clay</td> <td> Silt</td> <td> Sand</td> <td> Gravel</td> <td style="text-align: center;">UTP = Unable to Penetrate</td> </tr> </table> | Organics | Clay | Silt | Sand | Gravel | UTP = Unable to Penetrate | <p>Reviewed: PW Date: 10/30/2024</p> |
| Organics | Clay | Silt | Sand | Gravel | UTP = Unable to Penetrate | | |

SCALA LOG

SC3



WALKER
ENGINEERING
CONSULTANTS

Project: Geotechnical investigations
Location: 142 Konini Road, Auckland
Project No.: 24106
Client: Hugh Johnstone

Drill Type: Hand Auger - 50mm
Drilled by: PW
Logged by: PW
Date: 7/7/2024

Coordinates:
 See test location plan
Relative Level (Moturiki):

Logged in accordance with FIELD DESCRIPTION OF SOIL AND ROCK.Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes.NZ Geotechnical Society Inc.19mm Shear Vane with shear vane conversions applied.

| Depth (m) | G.W. Level | Graphic Log | Soil Description (strength/density - fraction - colour - structure - moisture - bedding - plasticity - sensitivity - additional) | Depth (m) | Shear Vane (kPa) | Scala Penetrometer (blows/50mm) |
|-----------|------------|-------------|---|-----------|------------------|---------------------------------|
| 0.0 | | | TOPSOIL intermixed with clayey silts and sands | | | 0 1 2 3 4 5 6 7 8 9 10 |
| 0.5 | | | SILT and SAND - sandy - stiff and very dense - orange with some sands - low plasticity - fine to medium. | | | |
| 1.0 | | | FILL - Very Hard | | | |
| 1.0 | | | End of borehole at 1.0m bgl - UTP | | | |
| 1.5 | | | | | | |
| 2.0 | | | | | | |
| 2.5 | | | | | | |
| 3.0 | | | | | | |
| 3.5 | | | | | | |
| 4.0 | | | | | | |

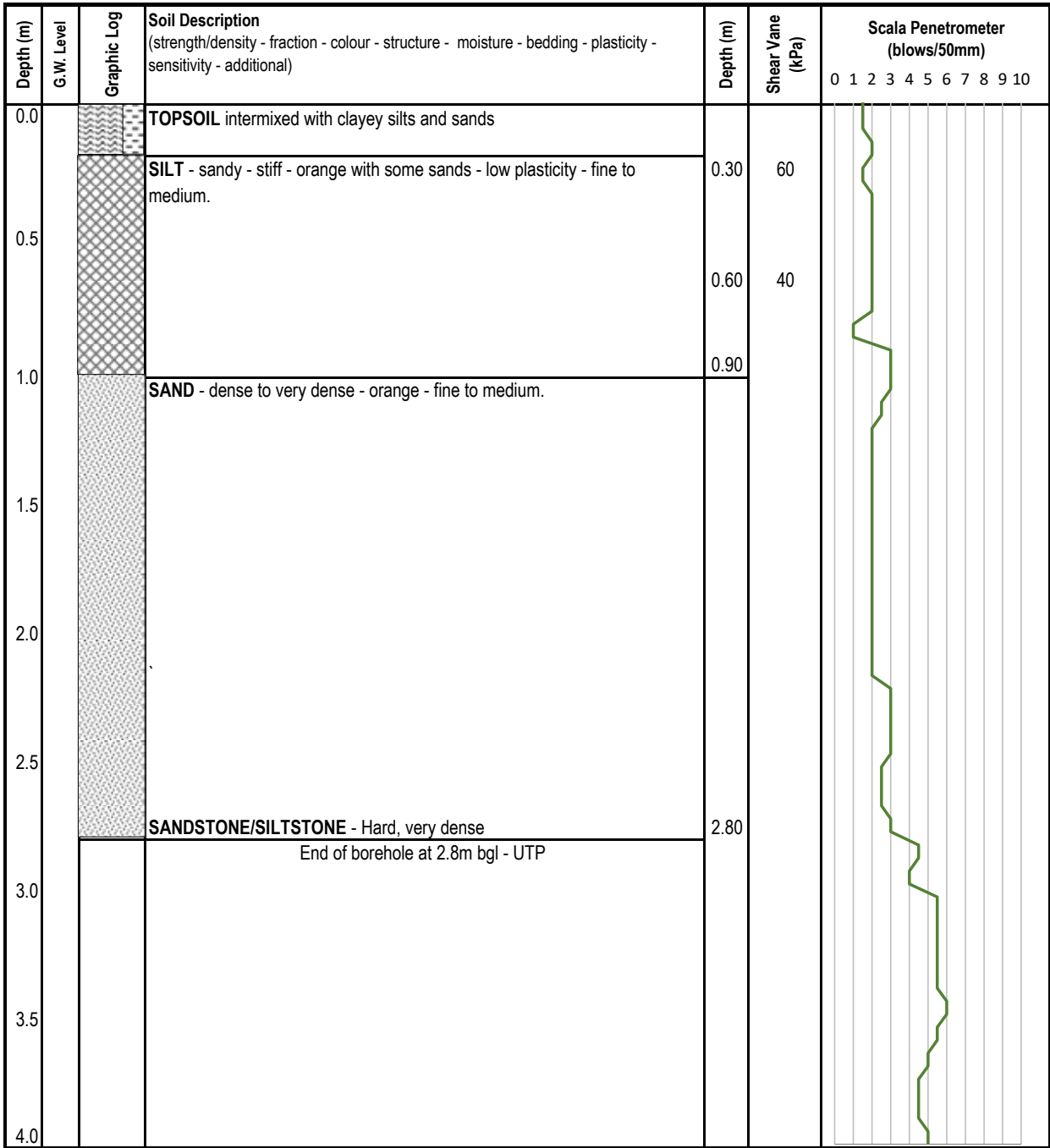
Notes: No free groundwater observed.

Legend:
 Organics Clay Silt Sand Gravel UTP = Unable to Penetrate

Reviewed: PW
 Date: 10/30/2024

| | | |
|---|--------------|---------------------------------------|
| <h1>BOREHOLE LOG</h1> | <h1>HA4</h1> | WALKER ENGINEERING CONSULTANTS |
| Project: Geotechnical investigations Location: 142 Konini Road, Auckland Project No.: 24106 Client: Hugh Johnstone | | |

| | | |
|--|--|--|
| Drill Type: Hand Auger - 50mm Drilled by: PW Logged by: PW Date: 7/7/2024 | Coordinates: See test location plan Relative Level (Moturiki): | Logged in accordance with FIELD DESCRIPTION OF SOIL AND ROCK.Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes.NZ Geotechnical Society Inc.19mm Shear Vane with shear vane conversions applied. |
|--|--|--|



Notes: No free groundwater observed.

| | |
|--|--|
| Legend: Organics Clay Silt Sand Gravel UTP = Unable to Penetrate | Reviewed: PW Date: 10/30/2024 |
|--|--|

Appendix B: Site Photos



Picture 1: Existing Carport before Removal



Picture 2: Existing Carport



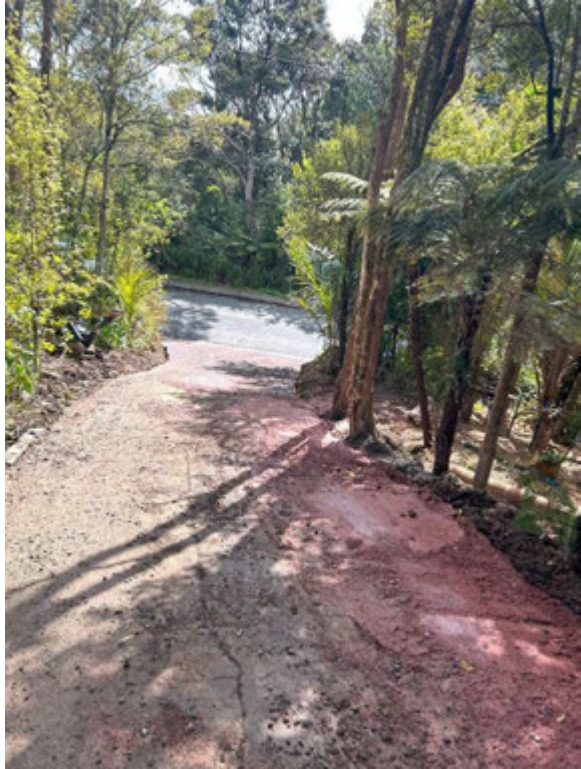
Picture 3: Existing Decking around Existing Pool



Picture 4: Existing Driveway Being Extended



Picture 5: Existing Driveway with Shed Removed



Picture 6: Existing Driveway



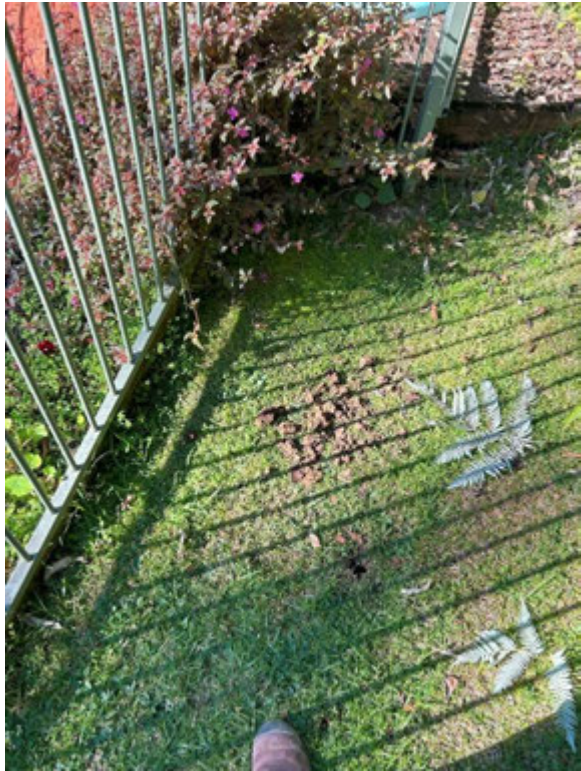
Picture 7: Existing Shed and Position of Proposed Retaining Wall



Picture 8: Existing Shed Foundation Edge near Slope



Picture 9: Hand Auger & Scala 1 Test Area near Pool



Picture 10: Hand Auger & Scala 2 Test Area near Pool



Picture 11: Hand Auger, Scala 4 Test Area & Existing Shed (2)



Picture 12: Hand Auger, Scala 4 Test Area & Existing Shed



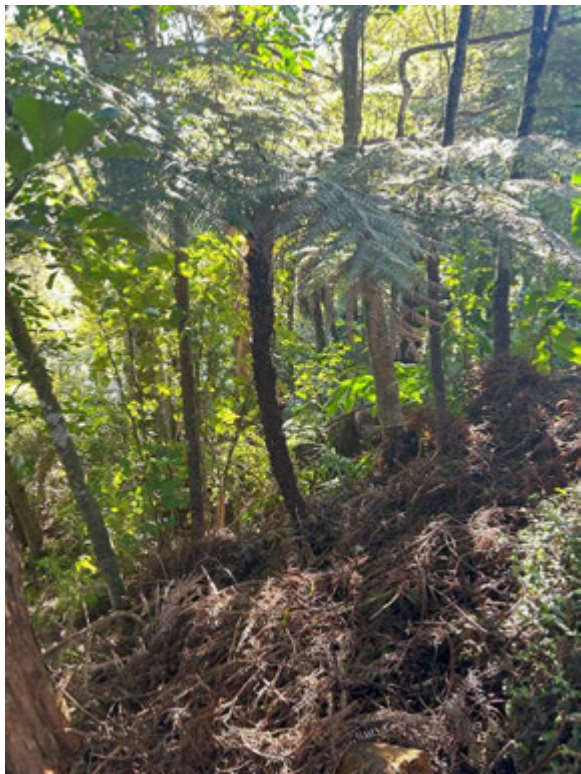
Picture 13: Hand Auger, Scala 4 Test Area (2)



Picture 14: Hand Auger, Scala 4 Test Area (3)



Picture 15: Hand Auger, Scala 4 Test Area



Picture 16: IMG_6462



Picture 17: IMG_6464



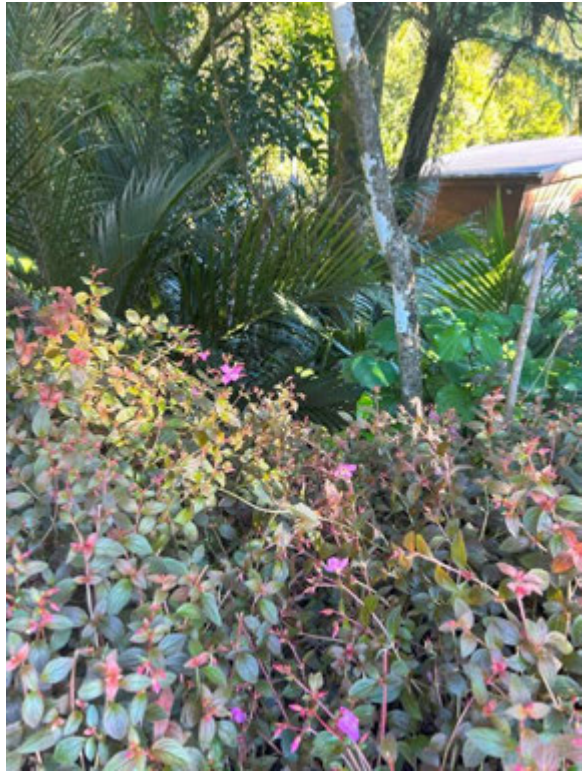
Picture 18: IMG_6466



Picture 19: IMG_6467



Picture 20: IMG_6468



Picture 21: IMG_6469



Picture 22: IMG_6470



Picture 23: IMG_6472



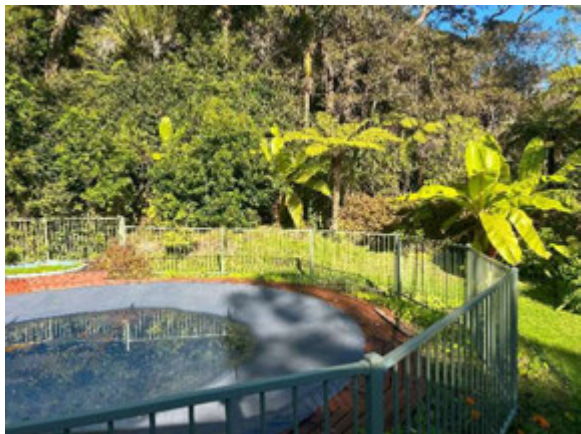
Picture 24: IMG_6473



Picture 25: IMG_6474



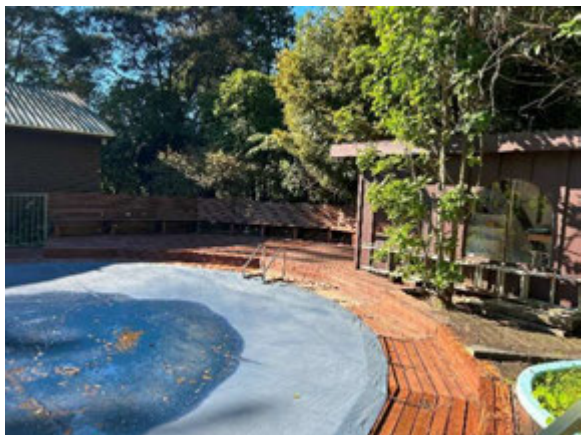
Picture 26: IMG_6476



Picture 27: IMG_6477



Picture 28: IMG_6480



Picture 29: IMG_6481



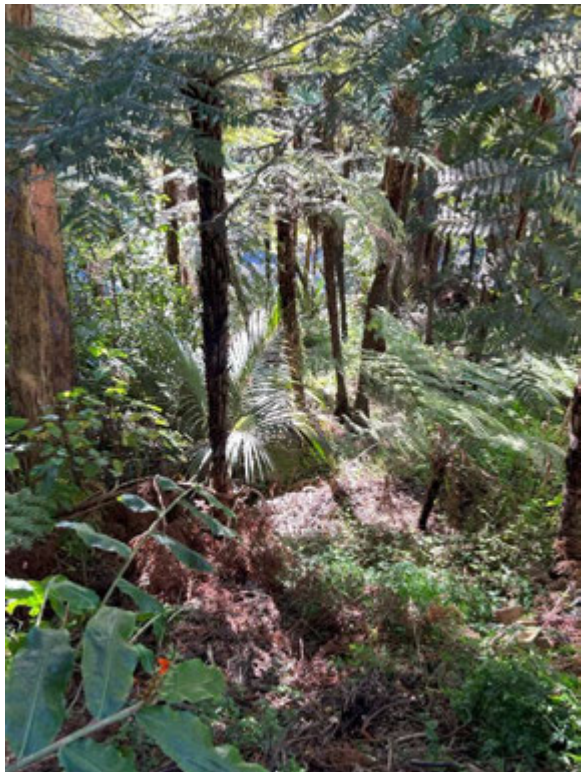
Picture 30: IMG_6482



Picture 31: IMG_6484



Picture 32: IMG_6489



Picture 33: IMG_6490



Picture 34: IMG_6494



Picture 35: IMG_6496



Picture 36: IMG_6497



Picture 37: IMG_6933



Picture 38: Scala 3 Test Area near Carport (2)

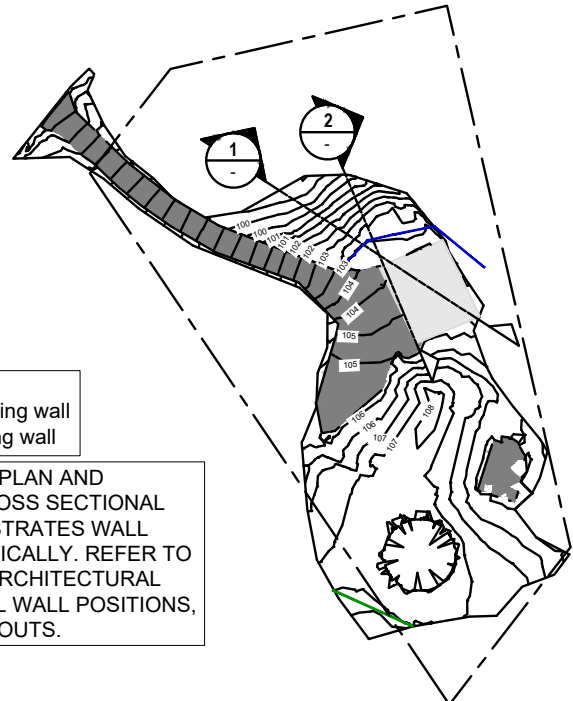


Picture 39: Scala 3 Test Area near Carport

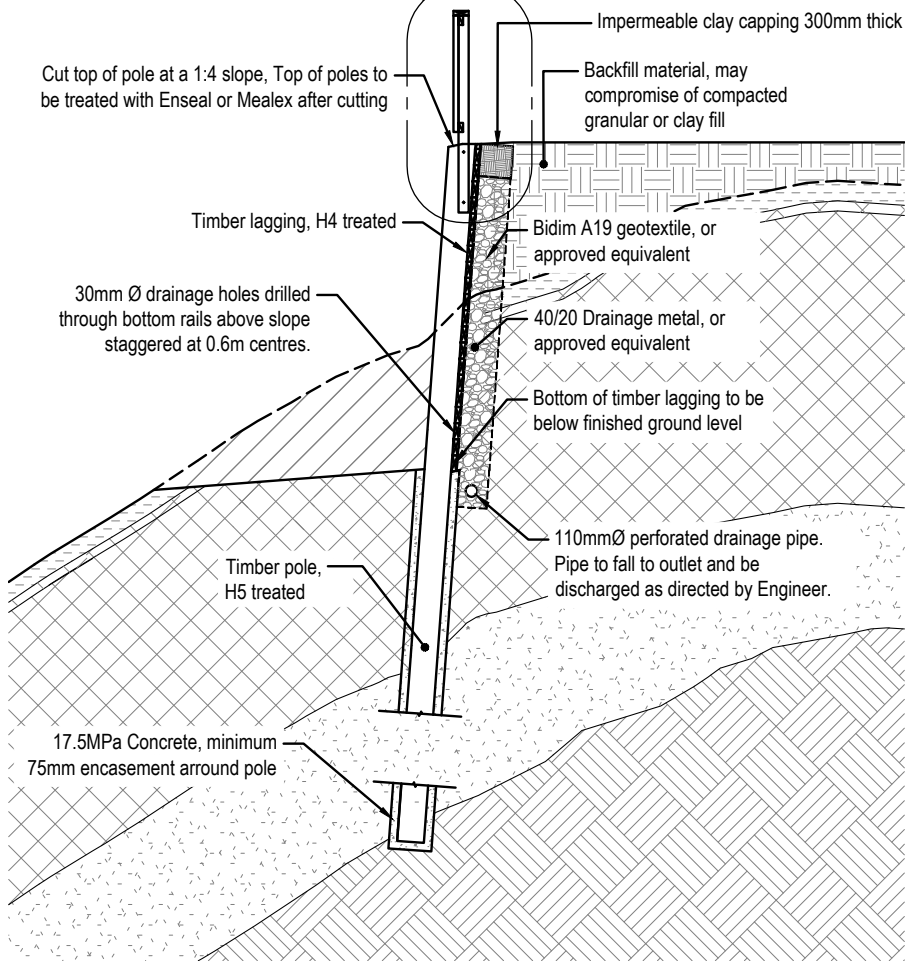
Appendix B.2: Ground Profile

KEY:
 - - - : Timber retaining wall
 - - - : Block retaining wall

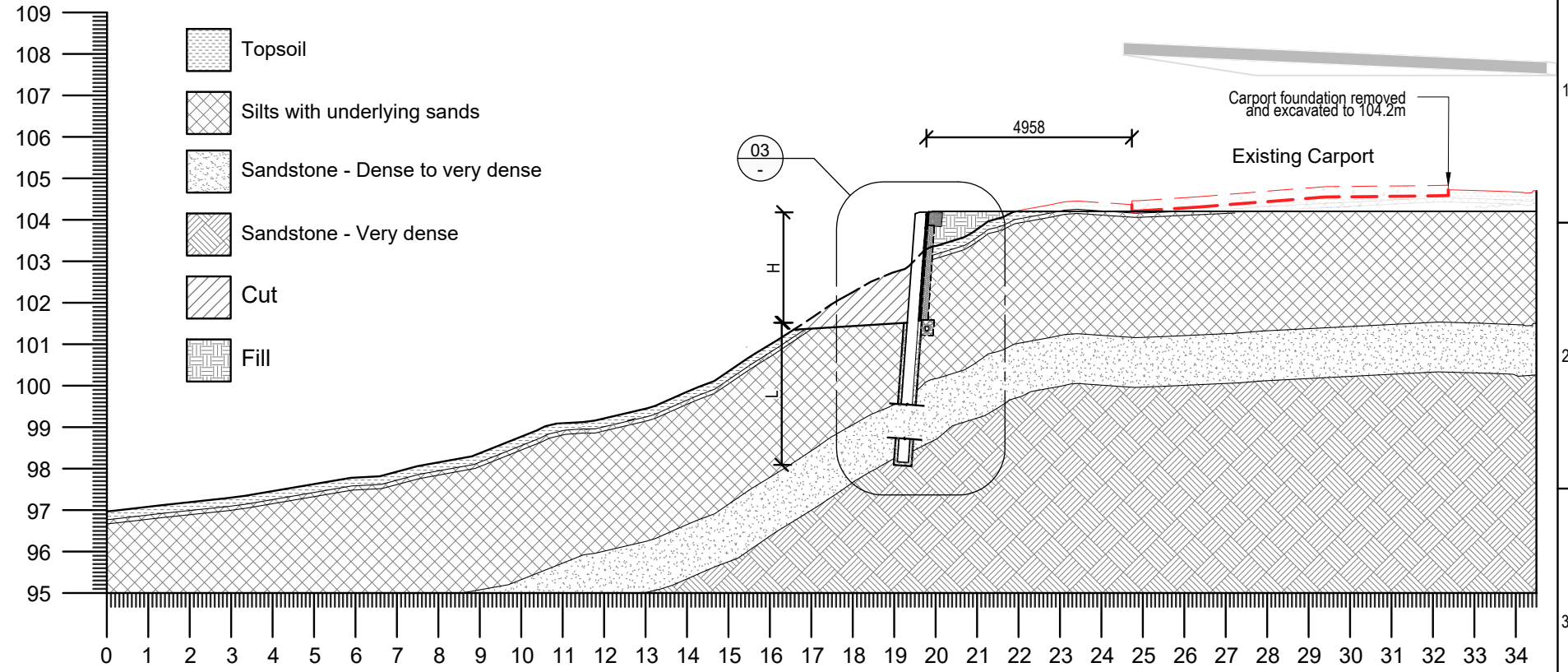
NOTE: THIS SITE PLAN AND ASSOCIATED CROSS SECTIONAL DRAWINGS ILLUSTRATES WALL TYPES SCHEMATICALLY. REFER TO THE FINALIZED ARCHITECTURAL PLANS FOR FINAL WALL POSITIONS, LEVELS AND LAYOUTS.



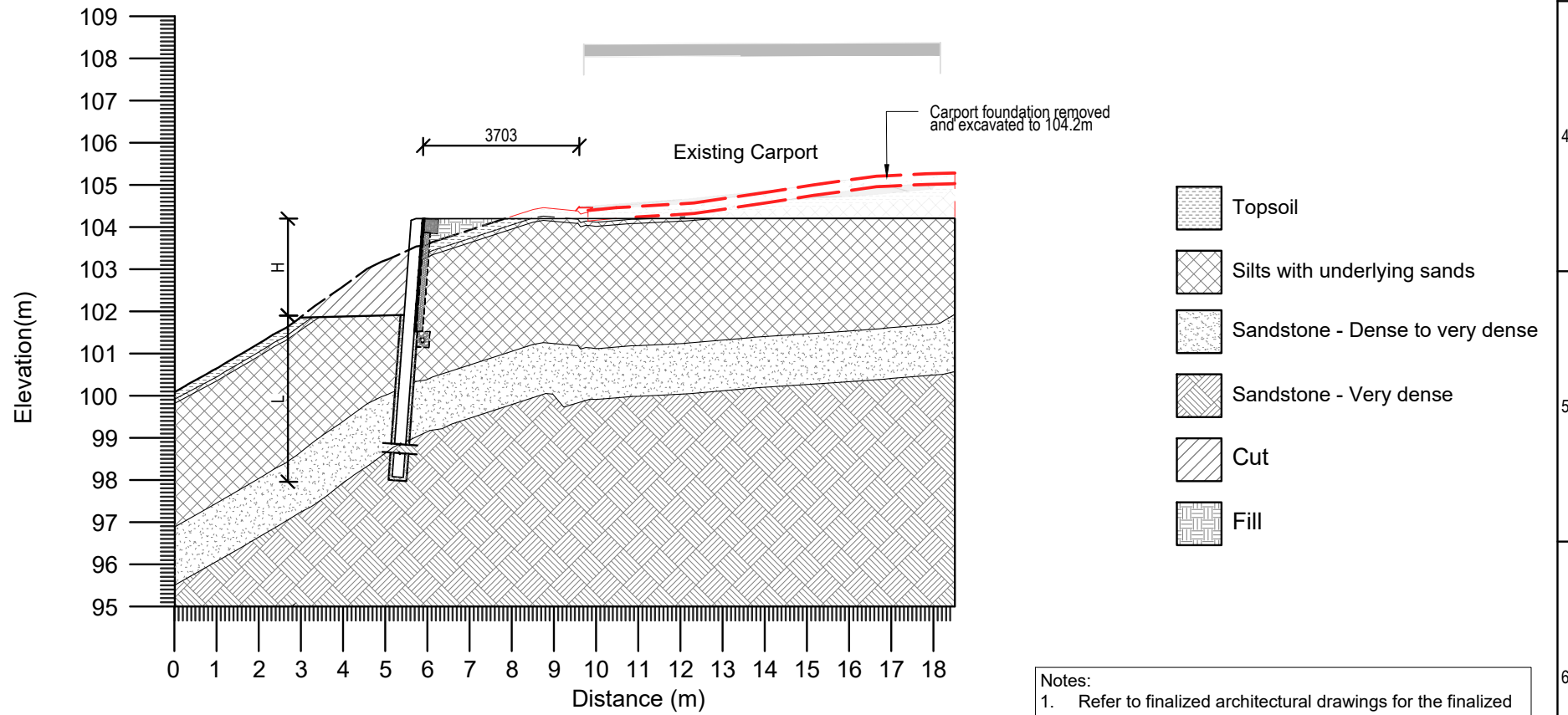
01 SITE PLAN
 Scale 1:750



03 TIMBER RTW CALLOUT
 Scale 1:75



01 SECTION 01
 Scale 1:150



02 SECTION 02
 Scale 1:150

Notes:
 1. Refer to finalized architectural drawings for the finalized wall positions, levels and layout.
 2. Refer to Drawing T02 for pole size, depths and spacing.

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | 02 | FOR CONSENT | PW | APRIL 2025 |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |

Verify all dimensions on site before commencing work. Prioritise figured dimensions over scaling. Refer all discrepancies to the drawing office. This document and the copyright in this document remain the property of Walker Engineering Consultants Limited. The contents of this document may not be reproduced either in whole or in part by any means whatsoever without the prior written consent of Walker Engineering Consultants Limited.



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 Consultants Limited
 Phone: 022 534 4973
 Email: peter@walkereng.co.nz
 Website: www.walkereng.co.nz



Client:
 HUGH JOHNSTONE
 Project Title:
 HUGH JOHNSTONE 142
 KONINI ROAD, AUCKLAND -
 SED

Sheet Title:
 TIMBER RETAINING WALL &
 GEOLOGICAL PROFILE SECTIONS

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | T01 | Sheet #: | 02 |

Appendix B.3: Slope Stability Assessments



Setting Information

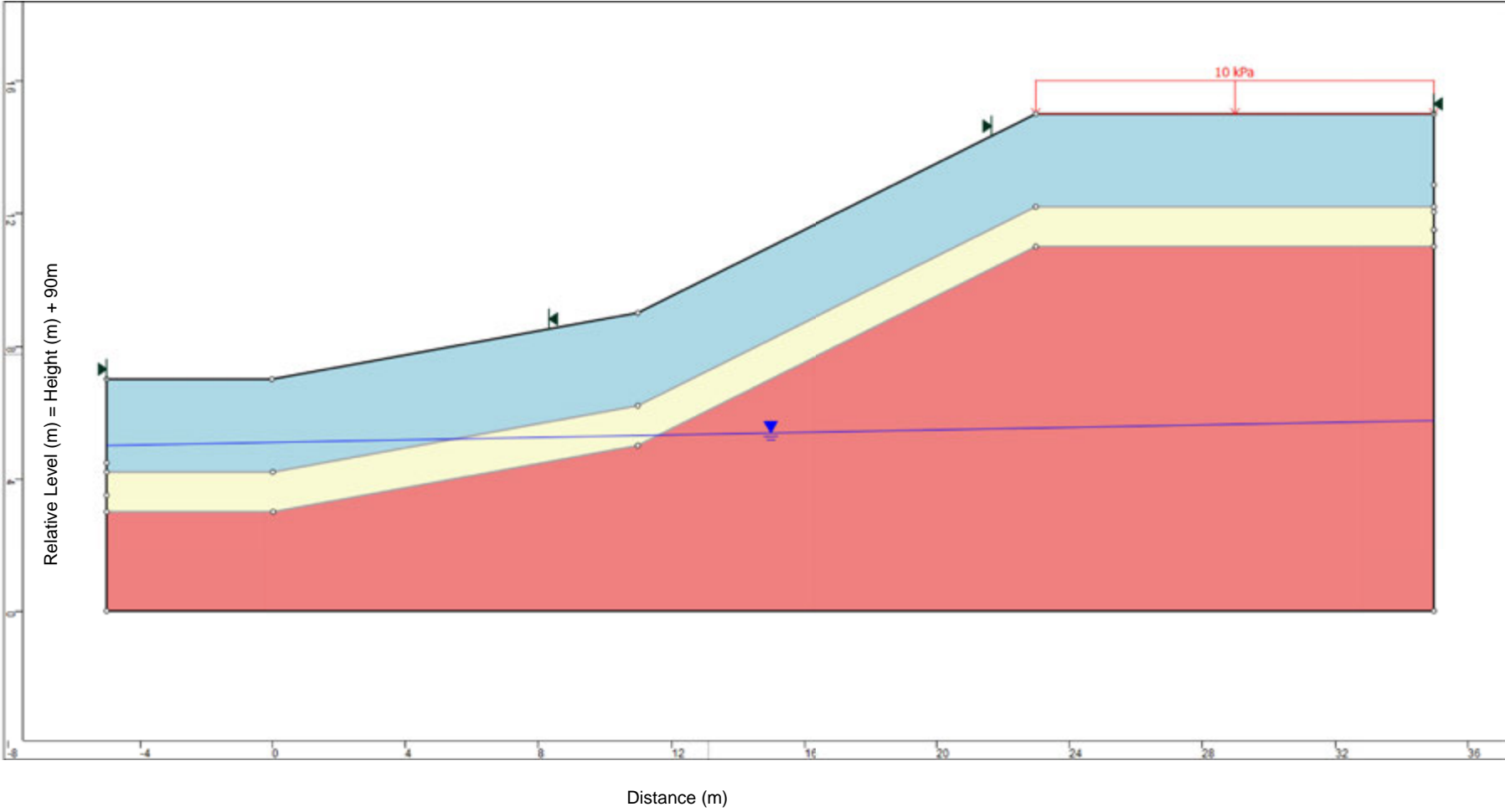
Physical Unit: Metric
 Failure Direction:
 Right to Left
 Methods:
 GLE/Morgenstern-Price

Assigned Soil Material

- Silts (MC)
- Sandstone/Siltstone (MC)
- Sands (MC)

Applied Load Info

Constant Load



CASES: PRE DEVELOPMENT

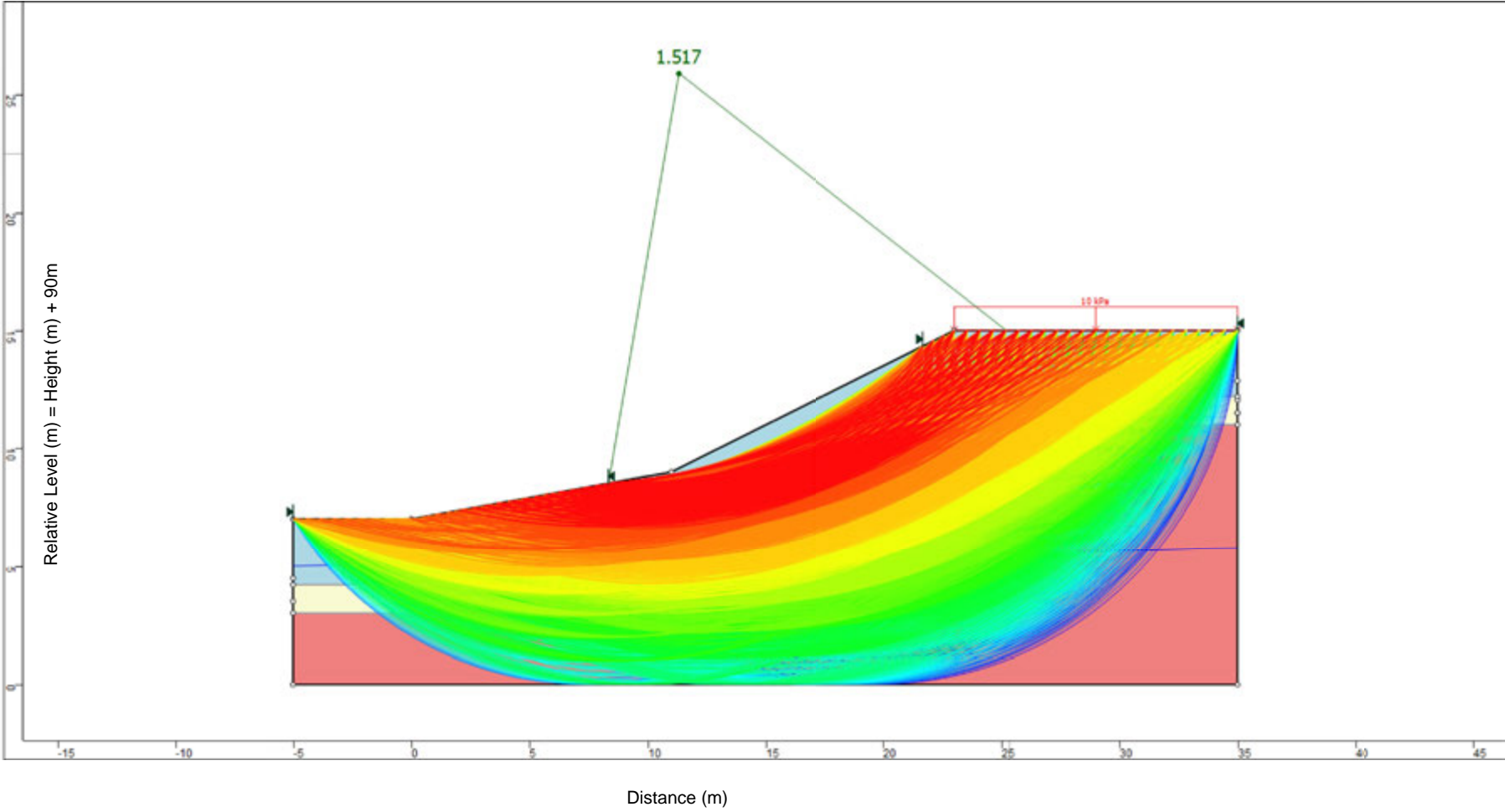
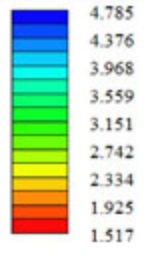


WALKER ENGINEERING CONSULTANTS

Factor of Safety Info.

Method: GLE/Morgenstern-Price
Min. FOS: 1.51656
Center: 11.3153,25.8961
Radius: 17.6353
Left Surface Endpoint: 8.332,8.514
Right Surface Endpoint: 25.1818,15

FOS Contour Plot



CASE: C1 – PRE DEVELOPMENT – STATIC LONG-TERM CONDITIONS - NORMAL

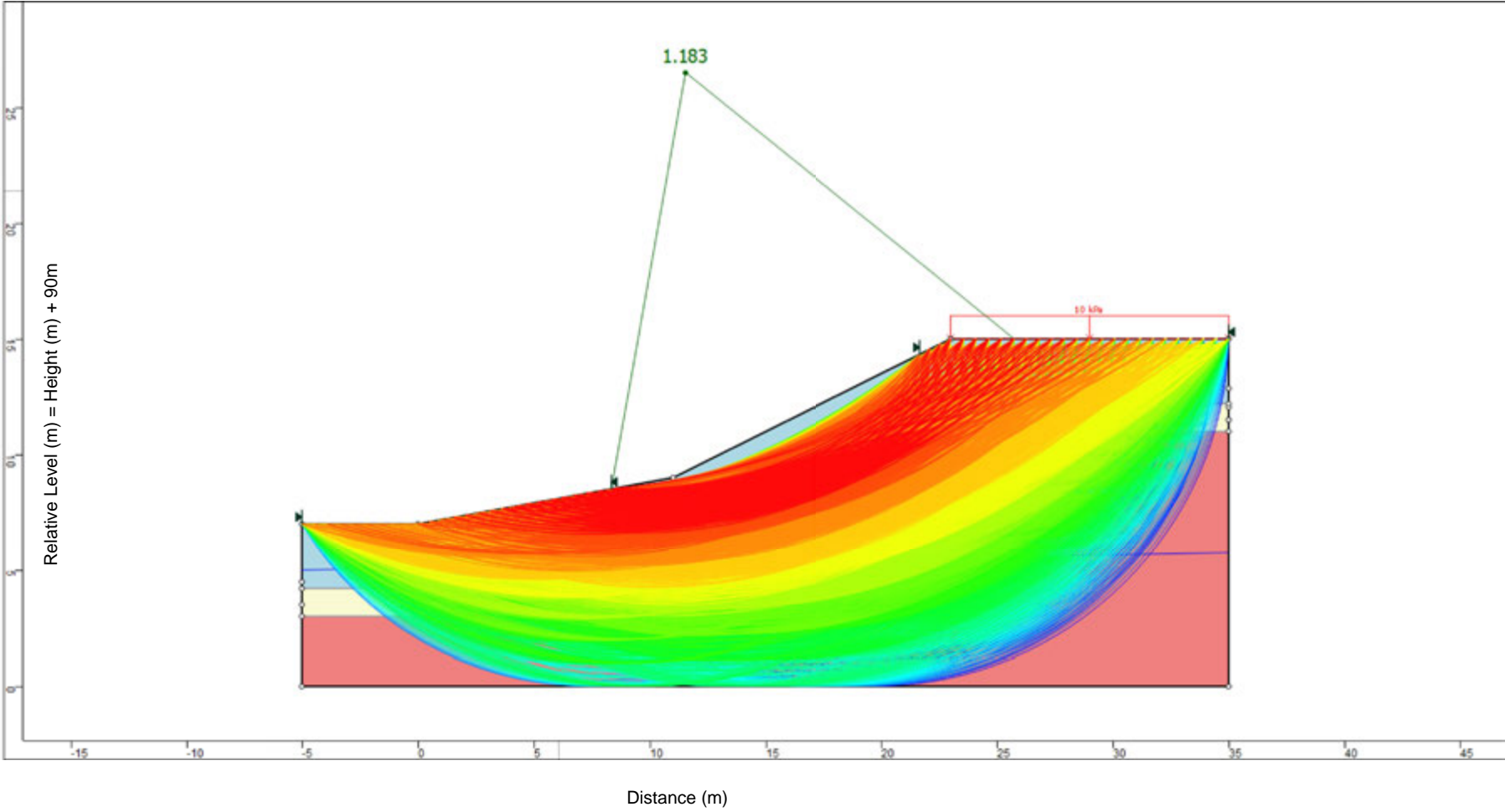
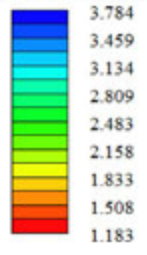


WALKER ENGINEERING CONSULTANTS

Factor of Safety Info.

Method: GLE/Morgenstern-Price
Min. FOS: 1.18261
Center: 11.5313,26.5059
Radius: 18.2732
Left Surface Endpoint: 8.332,8.5149
Right Surface Endpoint: 25.7273,15

FOS Contour Plot



CASE: C2 – PRE DEVELOPMENT – STATIC LONG-TERM CONDITIONS - TRANSIENT

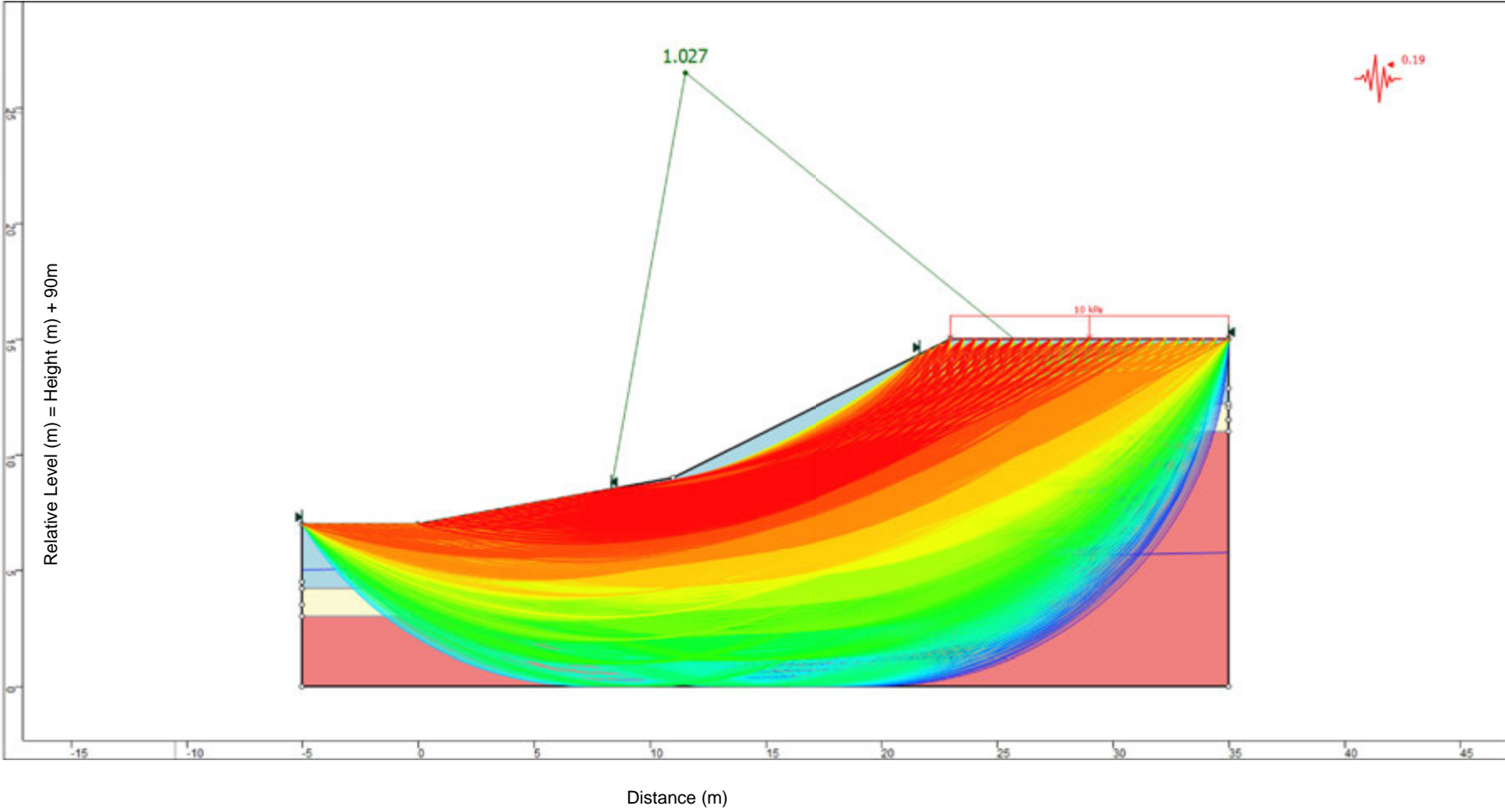
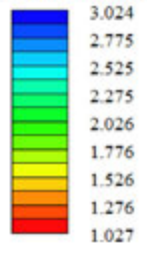


WALKER ENGINEERING CONSULTANTS

Factor of Safety Info.

Method: GLE/Morgenstern-Price
Min. FOS: 1.0268
Center: 11.5313,26.5059
Radius: 18.2732
Left Surface Endpoint: 8.332,8.514
Right Surface Endpoint: 25.7273,15

FOS Contour Plot



CASE: C3 – PRE DEVELOPMENT – NORMAL – SEISMIC CONDITIONS



WALKER ENGINEERING CONSULTANTS

Setting Information

Physical Unit: Metric
Failure Direction:
Right to Left
Methods:
GLE/Morgenstern-Price

Assigned Soil Material

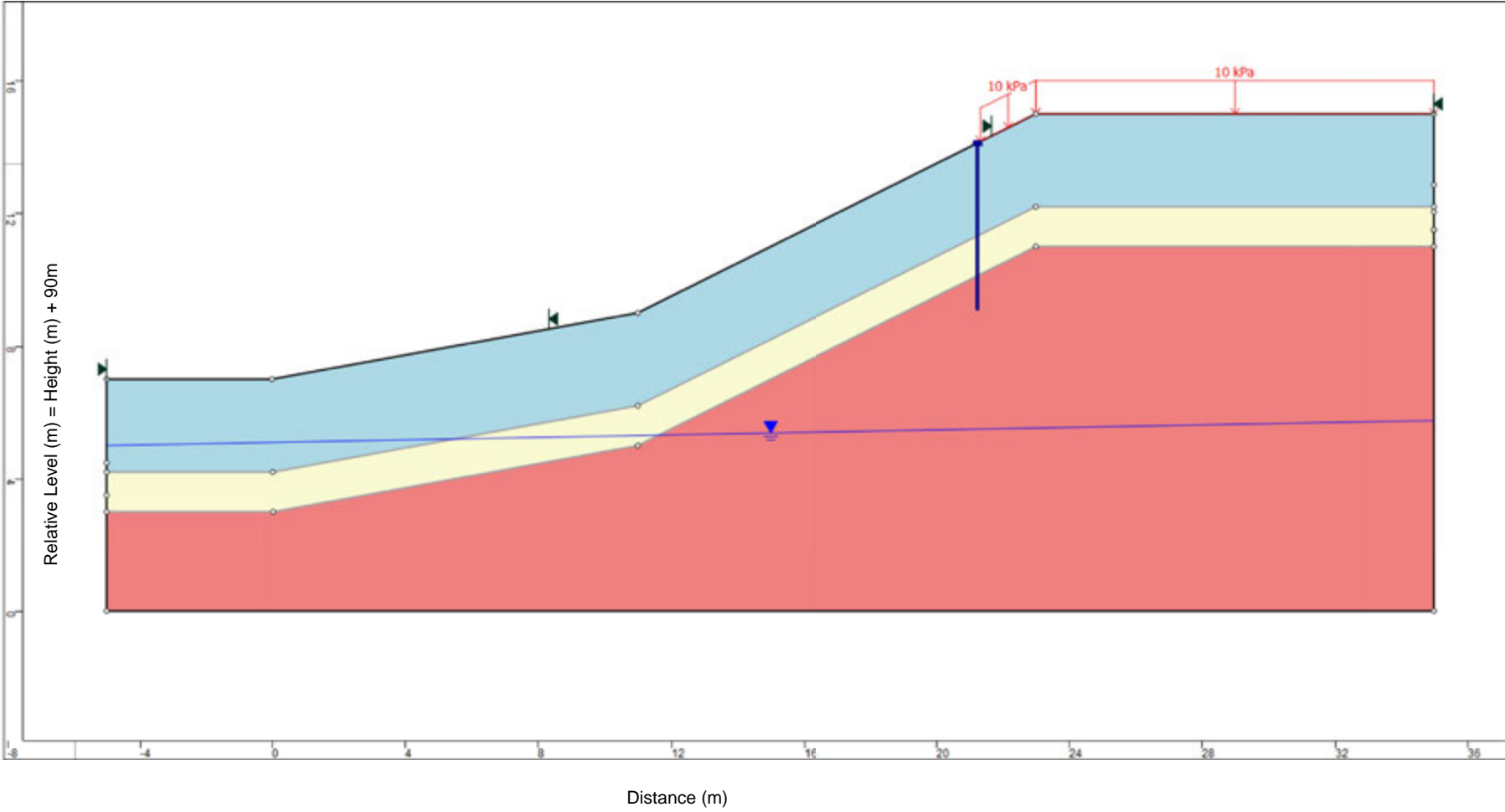
- Silts (MC)
- Sandstone/Siltstone (MC)
- Sands (MC)

Applied Load Info

Constant Load

Installed Support Info

Pile Support



CASES: – POST DEVELOPMENTS

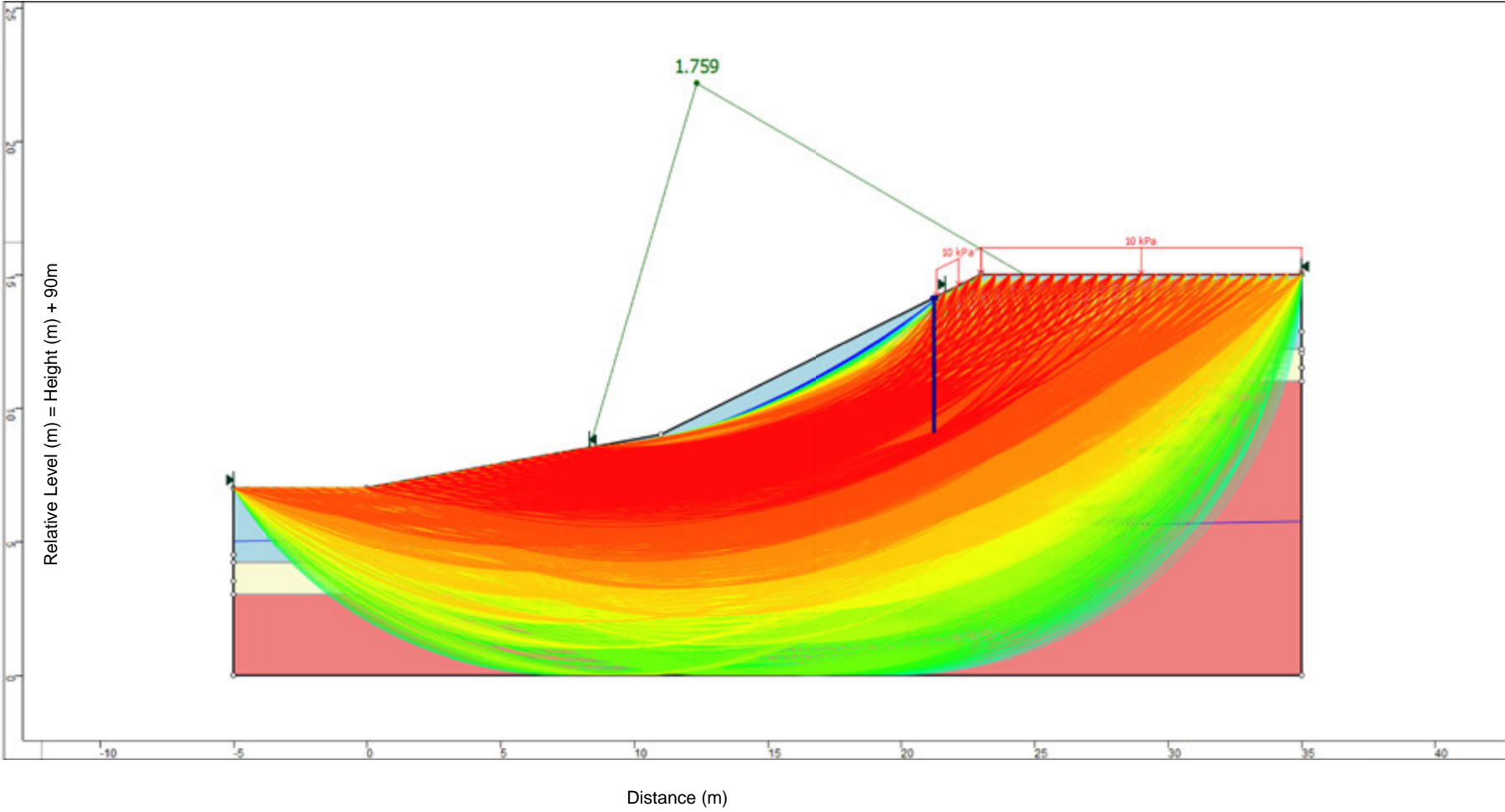
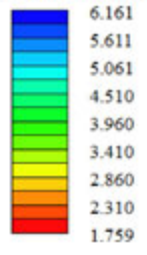


WALKER ENGINEERING CONSULTANTS

Factor of Safety Info.

Method: GLE/Morgenstern-Price
Min. FOS: 1.75932
Center: 12.3406,22.1749
Radius: 14.236
Left Surface Endpoint: 8.332,8.514
Right Surface Endpoint: 24.6364,15

FOS Contour Plot



CASE: C4 – POST DEVELOPMENT – STATIC LONG-TERM CONDITIONS - NORMAL

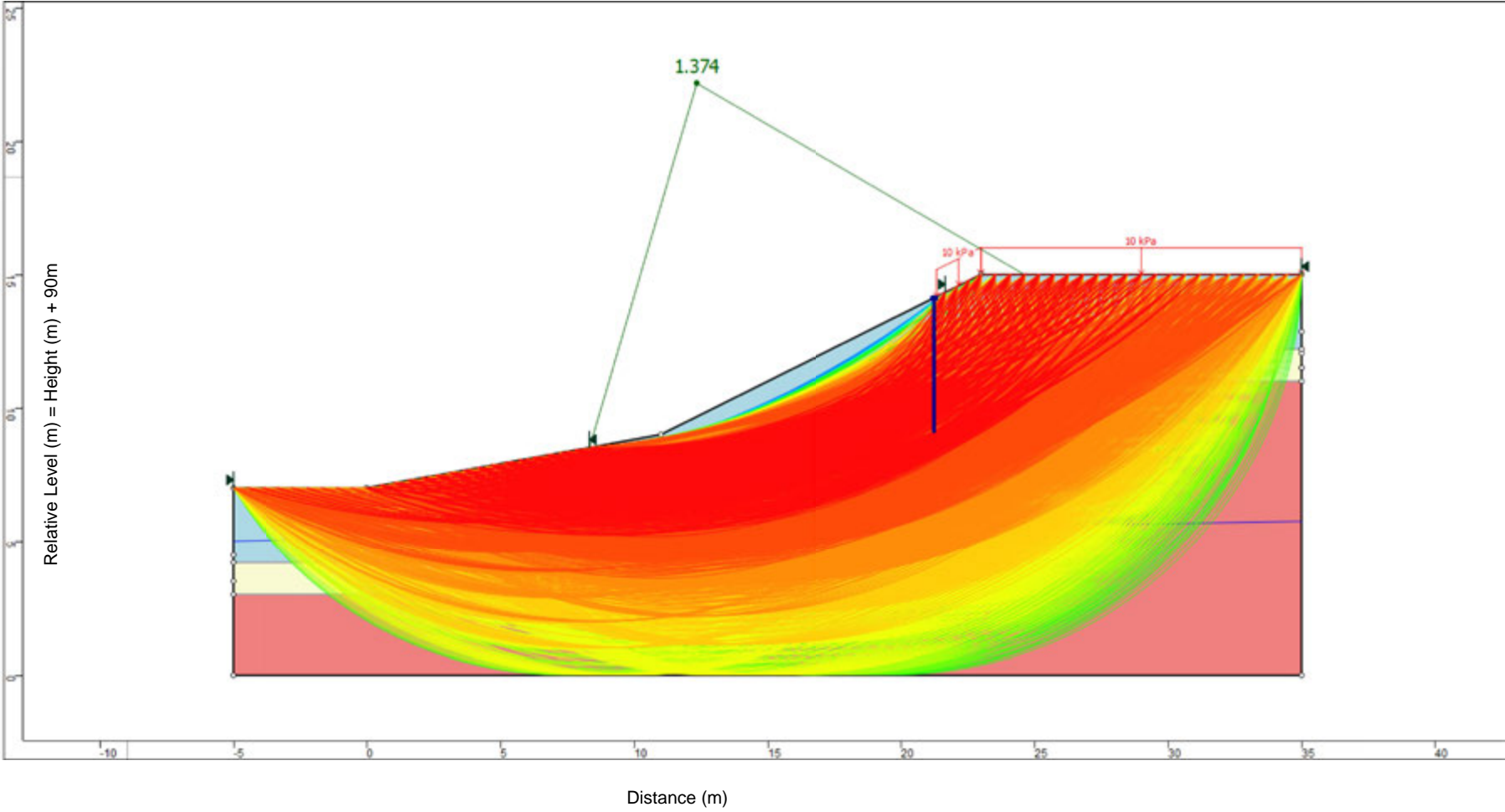
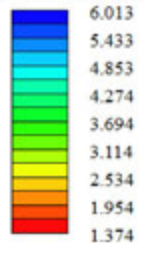


WALKER ENGINEERING CONSULTANTS

Factor of Safety Info.

Method: GLE/Morgenstern-Price
Min. FOS: 1.37446
Center: 12.3406,22.1749
Radius: 14.236
Left Surface Endpoint: 8.332,8.514
Right Surface Endpoint: 24.6364,15

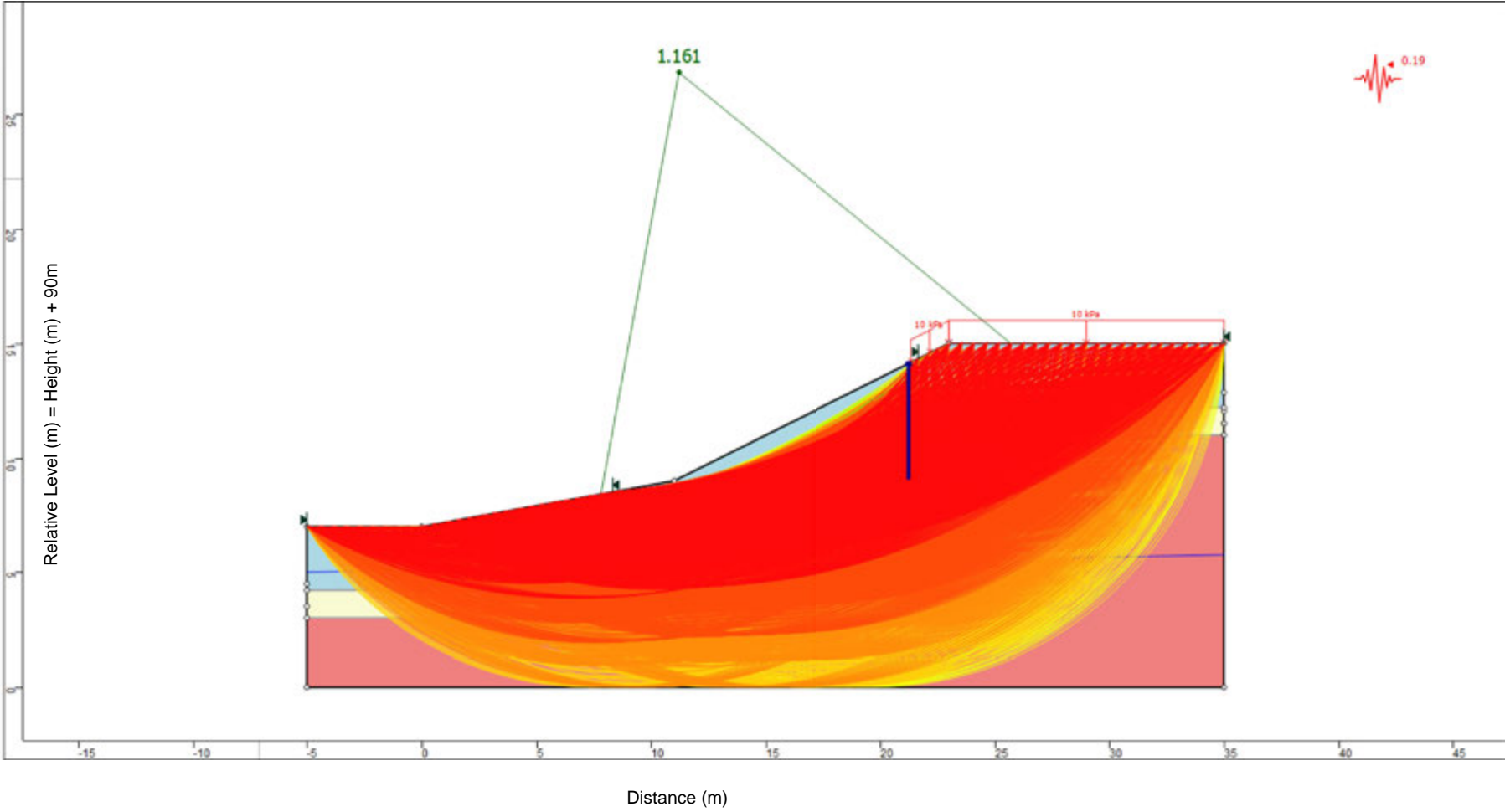
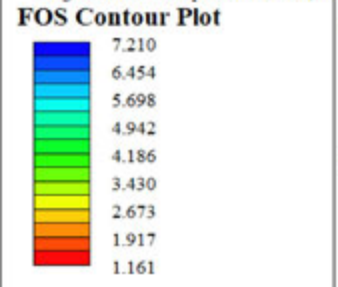
FOS Contour Plot



CASE: C5 – POST DEVELOPMENT – STATIC LONG-TERM CONDITIONS - TRANSIENT



Factor of Safety Info.
Method: GLE/Morgenstern-Price
Min. FOS: 1.16122
Center: 11.2113,26.8439
Radius: 18.7348
Left Surface Endpoint: 7.81125,8.42
Right Surface Endpoint: 25.7273,15



CASE: C6 – POST DEVELOPMENT – NORMAL – SEISMIC CONDITIONS

Appendix C: Selected Concept Drawings and Geological Profile Sections

(If the document is not embedded in the report, refer to separated latest PDF file revisions)

| 24106 - SHEET LIST TABLE | | | |
|---|------------------------------------|---|---|
| SHEET CATEGORY | SHEET No. | SHEET LIST | REVISION No. |
| COVER PAGE AND STANDARD NOTES/DETAILS | CP1 | COVER PAGE AND SHEET LIST | 02 |
| | SN1 | STANDARD NOTES SHEET 01 | 01 |
| | SN2 | STANDARD NOTES SHEET 02 | 01 |
| | SMD | STANDARD MASONRY DETAILS | 01 |
| | SCD | STANDARD CONCRETE DETAILS | 01 |
| EXISTING HOUSE ALTERATION DETAILS | F01 | SLAB JOINT AND CONCRETE FOOTING DETAILS | 01 |
| | TJ | TIMBER JOIST CONNECTION DETAIL | 01 |
| | TL1 | TIMBER LINTEL DETAILS SHEET 01 | 01 |
| | TL2 | TIMBER LINTEL DETAILS SHEET 02 | 01 |
| | TL3 | TIMBER LINTEL DETAILS SHEET 03 | 01 |
| EARTH WORKS & RETAINING WALL DETAILS | E01 | EARTH WORKS 3D VIEW | 01 |
| | T01 | TIMBER RETAINING WALL & GEOLOGICAL PROFILE SECTIONS | 01 |
| | T02 | TYPICAL TIMBER RETAINING WALL AT GARAGE SHEET 02 | 01 |
| | T03 | TYPICAL TIMBER RETAINING WALL AT POOL SHEET 03 | 01 |
| | BL1 | TYPICAL TIMBER BALUSTRADE DETAIL | 01 |
| | BR1 | TYPICAL BLOCK RETAINING WALL SHEET 01 | 01 |
| | BR2 | TYPICAL BLOCK RETAINING WALL SHEET 02 | 02 |
| | BR3 | TYPICAL BLOCK RETAINING WALL SHEET 03 | 02 |
| DECK AND POOL SUBFLOOR STRUCTURAL DETAILS | TP1 | SUBFLOOR ANCHOR PILE AND ORDINARY PILE DETAILS | 01 |
| | TP2 | BRACED PILE DETAILS | 01 |
| | TBJ | TIMBER BEARER AND JOIST CONNECTION DETAILS | 01 |
| | GARAGE PORTAL & FOUNDATION DETAILS | FT01 | WAFFLE SLAB FOUNDATION DETAILS SHEET 01 |
| FT02 | | WAFFLE SLAB FOUNDATION DETAILS SHEET 02 | 01 |
| FT03 | | WAFFLE SLAB FOUNDATION DETAILS SHEET 03 | 01 |
| FT04 | | WAFFLE SLAB FOUNDATION DETAILS SHEET 04 | 01 |
| FT05 | | WAFFLE SLAB FOUNDATION DETAILS SHEET 05 | 01 |
| S01 | | PFC PORTAL, CONNECTION DETAILS AND RAFTER DETAIL | 01 |
| STORMWATER, EARTHWORKS AND SEDIMENT CONTROL DETAILS | SW01 | RAIN-WATER TANK DETAILS | 01 |
| | SW02 | RAIN-WATER TANK FILTRATION SYSTEM | 01 |
| | SW03 | STORMWATER DRAINS AND TRENCHES | 01 |
| | SW04 | G13 & AS3 DRAINS AND TRENCHES | 01 |
| | EC01 | GENERAL SEDIMENT CONTROL SHEET 01 | 01 |
| | EC02 | GENERAL SEDIMENT CONTROL SHEET 02 | 01 |
| | ESC | EROSION AND SEDIMENT CONTROL PLANS | 01 |
| | ISO | SITE EARTHWORKS PLAN | 01 |



WALKER ENGINEERING CONSULTANTS

PREPARED BY: WALKER ENGINEERING CONSULTANTS

CONTENT: STRUCTURAL AND CIVIL ENGINEERING DETAILS

ISSUED FOR: CONSENT

PROJECT NUMBER: 24106

LOCATION: 142 KONINI ROAD, AUCKLAND

PROJECT TITLE: HUGH JOHNSTONE 142 KONINI ROAD, AUCKLAND - SED

PREPARED FOR: HUGH JOHNSTONE



| | | | | |
|----------------|-----|-----------------------|-------------|---------------|
| Surveyed: LOSC | | | | |
| Designed: PW | 02 | FOR CONSENT - REVISED | PW | FEBRUARY 2025 |
| Drawn: JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: PW | Rev | Revision Details | Approved by | Date |

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Client: HUGH JOHNSTONE
 Project Title: HUGH JOHNSTONE 142 KONINI ROAD, AUCKLAND - SED

Sheet Title: COVER PAGE AND SHEET LIST

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | CP1 | Sheet #: | 02 |

GENERAL NOTES:

- THE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS DRAWINGS SPECIFICATIONS AND WITH SUCH OTHER INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT.
- MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE NEW ZEALAND BUILDING CODE. THE CURRENT EDITION OF THE RELEVANT NZ STANDARD NOTES, INCLUDING ASSOCIATED STANDARDS AND LOCAL AUTHORITY REGULATIONS EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL COMPLY WITH ALL OSH AND ON SITE HEALTH AND SAFETY REQUIREMENTS AS AT ALL TIMES.
- THESE DRAWINGS SHOW THE DESIGN INTENT AND ARE NOT SHOP DRAWINGS. IF REQUIRED, ALL TO COMPLETE SHOW DRAWINGS FOR FABRICATION, SHOP DRAWINGS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- REFER TO THE ARCHITECTURAL DRAWINGS FOR ALL SETTING OUT, NIBS, REBATES, SET-DOWNS AND THE LIKE.
- ALL DISCREPANCIES SHALL BE REFERRED TO THE ARCHITECT, CONSULTANT OR THE ENGINEER IF APPROPRIATE BEFORE PROCEEDING WITH THE WORK.
- ALL THE DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED. THE ENGINEERS DRAWINGS SHALL NOT BE SCALED.
- DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURE NO PARTS SHALL BE OVER STRESSED UNDER CONSTRUCTION ACTIVITIES. THIS INCLUDES ALL EXISTING OR TEMPORARY STRUCTURES FORMING PART OF, OR AFFECTED BY THE WORKS.
- IF DURING CONSTRUCTION ANY PART OF THE WORKS SHOWS SIGNS OF DISTRESS, EXCESSIVE DEFLECTION, CONFLICT OF COMPONENTS OR OTHER PROBLEMS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER, WHO SHALL INVESTIGATE AND ISSUE INSTRUCTIONS AS CONSIDERED NECESSARY.
- THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION AND THE MAINTENANCE OF ALL NECESSARY TEMPORARY WORKS TO ENSURE STRENGTH AND STABILITY OF THE STRUCTURE THROUGHOUT THE COURSE OF THE WORKS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, INSTALLATION AND MAINTENANCE OF ALL NECESSARY TEMPORARY WORKS TO ENSURE STRENGTH AND STABILITY OF THE STRUCTURE THROUGHOUT THE COURSE OF THE WORKS.
- THE CONTRACTOR IS TO DISCONNECT ALL SERVICES NECESSARY TO PROGRESS THE WORKS AT THE SITE BOUNDARY IN ACCORDANCE WITH THE BEST PRACTICE METHODS.
- THE CONTRACTOR IS TO ENSURE NO SITE UTILITY OR OTHER SERVICE IS DISRUPTED FOR ANY REMAINING TENANTS OR OTHER SERVICE USERS.
- UNLESS OTHERWISE NOTED, ALL LEVELS ARE IN METERS RELATIVE TO THE DATUM, ALL DIMENSIONS ARE IN MILLIMETERS.
- WHERE CONSTRUCTED WORKS DIFFER FROM THOSE SHOWN ON THE DRAWINGS THEN THE CONTRACTOR SHALL MARK THE AS-BUILT DETAILS ON A SET OF DRAWINGS AND SHALL INCLUDE BUT NOT LIMITED TO : LOCATION OF DRAINAGE OUTLETS AND EXTENT OF DRAINAGE WORKS, CHANGES TO WALL HEIGHT, ALIGNMENT, POLE SIZE, SPACING ECT.CHANGES AS PERTINENT TO THE STRUCTURE SHALL ALSO HAVE A WRITTEN CONFIRMATION FROM THE ENGINEER ATTACHED TO THE AS BUILT DRAWINGS.

APPLICABLE STANDARDS:

GENERAL SPECIFICATIONS FOR CONCRETE, STRUCTURAL STEELWORK, STRUCTURAL TIMBER AND MINOR EARTHWORKS

| STANDARDS | |
|--|-----------------|
| NZTA BRIDGE MANUAL | SP/M/022 |
| CORRUGATED PLASTIC PIPE SUBSOIL DRAIN CONSTRUCTION | TNZ F/02 |
| PIPE SUBSOIL DRAIN CONSTRUCTION | TNZ F/05 |
| STRUCTURAL STEEL AND HOLLOW SECTIONS | AS 1163 |
| PILING | AS 2195 |
| STEEL STRUCTURES STANDARD - MATERIALS, FABRICATION AND CONSTRUCTION | NZS 3404.1:2009 |
| PERFORATED PLASTIC DRAINAGE AND EFFLUENT PIPE AND FITTING | NZS 2439 |
| CONCRETE STRUCTURES STANDARD | NZS 3101 |
| CONCRETE CONSTRUCTION | NZS 3109 |
| SPECIFICATION FOR CONCRETE SURFACE FINISHES | NZS 3114 |
| CODE OF PRACTICE FOR SPECIFYING TIMBER AND WOOD-BASED PRODUCTS FOR USE IN BUILDING | NZS 3602 |
| TIMBER STRUCTURES STANDARD | NZS 3603 |
| CHEMICAL PRESERVATION OF ROUND AND SAWN TIMBER | NZS 3640 |
| TIMBER PILES AND POLES FOR USE IN BUILDINGS | NZS 3605 |
| NEW ZEALAND TIMBER GRADING RULES | NZS 3631 |
| ISO METRIC HEXAGON COMMERCIAL BOLTS AND SCREWS | AS/NZS 1111 |
| STRUCTURAL DESIGN ACTIONS | AS/NZS 1170 |
| STRUCTURAL WELDING, PART 1 : WELDING OF STEEL STRUCTURES | AS/NZS 1554 |
| GUIDE TO THE PROTECTION OF STRUCTURAL STEEL AGAINST CORROSION BY THE USE OF PROTECTIVE COATING: PART 1 : PAINT COATINGS PART 2 : HOT DIP GALVANISING | AS/NZS 2312 |
| STRUCTURAL STEEL - HOT ROLLED PLATES, FLOOR PLATES AND SLAB | AS/NZS 3678 |
| STRUCTURAL STEEL HOT-ROLLED BARS AND SECTIONS | AS/NZS 3679 |
| COLD-FORMED STEEL STRUCTURES | AS/NZS 4600 |
| STEEL REINFORCING MATERIALS | AS/NZS 4671 |
| HOT-DIP GALVANISED (ZINC) COATINGS ON FABRICATED FERROUS ATRICLES | AS/NZS 4680 |

TIMBER WALL SPECIFICATION :

THIS SPECIFICATION APPLIES TO THE PROPOSED TIMBER WALL RETAINING WALLS. IT SHOULD BE READ IN CONJUNCTION WITH THE DRAWINGS. WHERE THIS SPECIFICATIONS AND THE DRAWINGS CONTRADICT, THE DRAWINGS SHALL TAKE PRECEDENCE.

| | Timber Poles | Rough sawn timber |
|--------------------------------|--|-------------------|
| Bending | 38 MPa | 7.5 Mpa |
| Modulus of Elasticity | 8700 MPa | 4800 Mpa |
| Shear strength | 3.1 MPa | 2.4 Mpa |
| Preservative treatment class | H5 | H4 |
| Treatment for cut surfaces | Liberal brush of "Ensele" or approved equivalent | |
| Density | Normal | No.1 Framing |
| <i>Green condition assumed</i> | | |

- CONSTRUCTION WORKS PERFORMED ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE LATEST REVISIONS OF THE NEW ZEALAND BUILDING CODE HANDBOOK AND APPROVED DOCUMENTS (NZBC) AND COMPLY WITH THE GENERAL REQUIREMENTS OF THE LATEST REVISIONS.
- ENGINEER INSPECTIONS - ALL OR SOME WILL BE REQUIRED AND ARE TO BE CONFIRMED WITH THE ENGINEER.
 - PRIOR TO INSTALLATION OF POLES TO CONFIRM THE FOUNDING LEVEL OF THE POLES, POLE SPACINGS AND HOLE DIAMETER.
 - PRIOR TO BACK FILLING OF THE DRAINAGE SYSTEMS. CONFIRMING TIMBER LAGGING AND DRAINAGE SYSTEMS IS PER DRAWINGS OR OTHERWISE APPROVED.
 - TIMBER POLES, LAGGING, DRAINAGE METAL & CONCRETE DOCKETS TO BE INSPECTED FOR SIZE, TREATMENT LEVEL AND ANY OTHERWISE APPROVED.
 - UPON COMPLETION OF THE TIMBER WALL. CONFIRMING SOIL CAPPING AND DRAINAGE MATERIAL DEPTH BY PHYSICAL INSPECTION.
- OTHER:
 - TIMBER LAGGING TO BE NO.1 FRAMING GRADE, MINIMUM THICKNESS OF 50MM, SPAN 4 OR MORE POLES, BE BUTT JOINED AT TIMBER POLES ONLY
 - PRIOR TO SETTING OUT THE ALIGNMENT AND LOCATION OF THE TIMBER POLE WALL THE CONTRACTOR SHALL IDENTIFY AND LOCATE ALL SERVICES. IF THERE IS A POSSIBILITY OF CONFLICT BETWEEN SERVICES AND TIMBER POLES THE ENGINEER WILL THEN CONFIRM THE LOCATION OF THE TIMBER POLES, BASED ON THE CONTRACTOR'S SERVICES INFORMATION IN ORDER TO ENSURE THAT THE POLE LOCATIONS DO NOT CONFLICT WITH THOSE SERVICES.

TIMBER:

- ALL TIMBER TO BE MINIMUM RADIATA PINE GRADE VSG8.
- ALL TIMBER TO RECEIVE A MINIMUM OF H3 PRESERVATIVE TREATMENT UNLESS NOTED OTHERWISE.
- ALL CUT SURFACES TO RECEIVE A LIBERAL COATING OF METALEX CLEAR PRESERVATIVE.

CONCRETE REINFORCEMENT:

- SPLICES IN THE REINFORCEMENT SHALL BE AT LEAST 50 BAR DIAMETER UNO
- REINFORCEMENT SPLICES AND DEVELOPMENT LENGTH OF BARS AND WIRE IN TENSION AND/OR COMPRESSION SHALL NOT BE MADE OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS, OR IN ACCORDANCE WITH NZS 3101 SECTION 8.6.
- REINFORCEMENT SYMBOLS:
HR - DENOTES GRADE 500E PLAIN BAR
HD - DENOTES GRADE 500E DEFORMED BAR
- ALL WELDED MESH SHALL COMPLY WITH AS/NZS 4671 AND SHALL BE SUPPLIED AS FLAT SHEETS. TYPICAL WELDED MESH LAP: 350 min
- PLACE SUFFICIENT BAR CHAIRS UNDER BOTTOM REINFORCEMENT RODS AND TOP CROSS RODS IN SLABS TO ALLOW THEM TO BE SUPPORTED IN THEIR CORRECT POSITIONS DURING CONCRETING (NOT GREATER THAN 900MM CENTERS BOTH WAYS FOR BARS, 750MM FOR FABRIC)
- BAR CHAIRS TO BE PLASTIC.
- REINFORCING SHALL NOT BE WELDED WITHOUT WRITTEN PERMISSION OF ENGINEER, UNLESS OTHERWISE SHOWN ON THE DRAWINGS. IN NO CASE SHALL THE REINFORCING BE WELDED WITH IN 10 BAR DIA OF ANY BEND.
- HOOKS AND BENDS ARE TO BE IN ACCORDANCE WITH NZS 3109 SECTION 3.3 AND NZS 3101 SECTION 8.4
- DO NOT BEND STEEL ON SITE, UNLESS ABSOLUTELY NECESSARY, AND THEN ONLY WITH EQUIPMENT FIT FOR THE PURPOSE.
- DO NOT RE-BEND REINFORCING STEEL ONSITE WITHOUT PROPER EQUIPMENT/TOOLS, AND THE PROPER PREPARATION AND PREHEATING AS PER MBIE PRACTICE ADVISORY No.1.
- MINIMUM LAP LENGTH FOR REINFORCING SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
- D-BAR - 35 BAR DIA (CONC.) 40 BAR DIA (BLOCKWORK)
- H-BAR - 60 BAR DIA (CONC.) 70 BAR DIA (BLOCKWORK)

CONCRETE NOTES:

- CONSTRUCTION SHALL BE IN ACCORDANCE WITH NZS 3109 UNO & 4120
- MINIMUM CONCRETE STRENGTH AT 28 DAYS SHALL BE AS FOLLOWS.

| ELEMENT | MIN CONCRETE STRENGTH (UNLESS OTHERWISE NOTED) |
|--------------------------|--|
| SED FOUNDATIONS | 25MPa |
| BLOCKWORK | 25MPa |
| SITE CONCRETE (BLINDING) | 17.5MPa |

- SCHEDULE OF SURFACE FINISHES TO NZS 3114

| ELEMENT | FINISH |
|-----------------|--------|
| SLABS | U3 |
| FORMED SURFACES | F3 |

- TOLERANCES TO BE AS PER NZS 3109 SECTION 5.3.
- 15 x 15 CHAMFERS SHALL BE PROVIDED TO OUTER EDGES OF CONCRETE MEMBERS, UNO.
- MINIMUM CONCRETE COVER :75mm BOTTOM, 50mm SIDES AND TOP.
- EXPOSURE CLASSIFICATION FOR ALL ABOVE GROUND CONCRETE IS B1 AS PER NZS 3101 SECTION 3.4.2 EXPOSURE CLASSIFICATION DEFINITIONS:
 A1:
 - PROTECTED BY DAMP PROOF MEMBRANE
 - FULLY ENCLOSED WITHIN A BUILDING EXCEPT FOR A BRIEF PERIOD OF WEATHER EXPOSURE DURING CONSTRUCTION.
 A2:
 - IN NON AGGRESSIVE SOILS
 - ABOVE GROUND EXTERIOR IN AN INLAND ENVIRONMENT.
 B1 :
 - IN BUILDING PARTS THEREOF WHERE MEMBERS MAY BE SUBJECT TO REPEATED WETTING AND DRYING.
 - ABOVE GROUND EXTERIOR IN A COASTAL ENVIRONMENT.
 B2 :
 - WITHIN 100M OF HIGH TIDE MARK OR BETWEEN 100-500M OF THE HIGH TIDE MARK IN DIRECTION OF A PREVAILING OR COMMON WIND.

OTHER:

- WHERE CONCRETE IS CAST IN FORMWORK COMPLYING WITH NZS 3109 AND COMPACTED IN ACCORDANCE WITH NZS 3109, THE COVER SHALL BE NOT LESS THAN THE VALUE GIVEN IN THE TABLE BELOW, APPROPRIATE TO THE EXPOSURE CLASSIFICATION AND SPECIFIED CONCRETE STRENGTH.
- WHERE CONCRETE IS CAST ON OR AGAINST GROUND AND COMPACTED IN ACCORDANCE WITH NZS 3109, THE MINIMUM COVER FOR A SURFACE IN CONTACT WITH THE GROUND SHALL BE 75MM OR 50MM IF USING A DAMP-PROOF MEMBRANE BETWEEN THE GROUND AND THE CONCRETE TO BE CAST.

| EXPOSURE CLASSIFICATION | SPECIFIED COMPRESSIVE STRENGTH F _c (Mpa) | | | | | | | | |
|-------------------------|---|----|----|----|----|----|----|----|----|
| | 17.5 | 20 | 25 | 30 | 35 | 40 | 50 | 60 | 70 |
| | MINIMUM REQUIRED COVER (mm) | | | | | | | | |
| A1 | 30 | 25 | 25 | 20 | 20 | 20 | 20 | 15 | 15 |
| A2 | 50 | 40 | 35 | 30 | 30 | 25 | 25 | 20 | 20 |
| B1 | 60 | 50 | 40 | 35 | 35 | 30 | 30 | 25 | 25 |
| B2 | - | - | - | 45 | 40 | 35 | 30 | 30 | 25 |

DRAWING ABBREVIATIONS:

| | | | |
|-------|--------------------------|---------|----------------------|
| REF | - REFER | CRS | - CENTERS |
| REINF | - REINFORCEMENT | Ø | - DIAMETER |
| SOP | - SET OUT POINT | DWG | - DRAWING |
| THK | - THICK | EW | - EACH WAY |
| TOS | - TOP OF STEEL | GALV | - GALVANIZED |
| UIS | - UNDERSIDE | HD GALV | - HOT DIP GALVANIZED |
| UNO | - UNLESS NOTED OTHERWISE | MAX | - MAXIMUM |
| SFL | - STRUCTURAL FLOOR LEVEL | NOM | - NOMINAL |
| SIM | - SIMILAR | MIN | - MINIMUM |
| | | NTS | - NOT TO SCALE |

| | | | | | |
|--|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |
| Verify all dimensions on site before commencing work. Prioritise figured dimensions over scaling. Refer all discrepancies to the drawing office. This document and the copyright in this document remain the property of Walker Engineering Consultants Limited. The contents of this document may not be reproduced either in whole or in part by any means whatsoever without the prior written consent of Walker Engineering Consultants Limited. | | | | | |



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Website: www.walkereng.co.nz



Client:
HUGH JOHNSTONE

Project Title:
HUGH JOHNSTONE 142
KONINI ROAD, AUCKLAND -
SED

Sheet Title:
STANDARD NOTES
SHEET 01

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | | Sheet #: | SN1 |
| | | Rev No.: | 01 |

DRAINAGE AND WATERPROOFING:

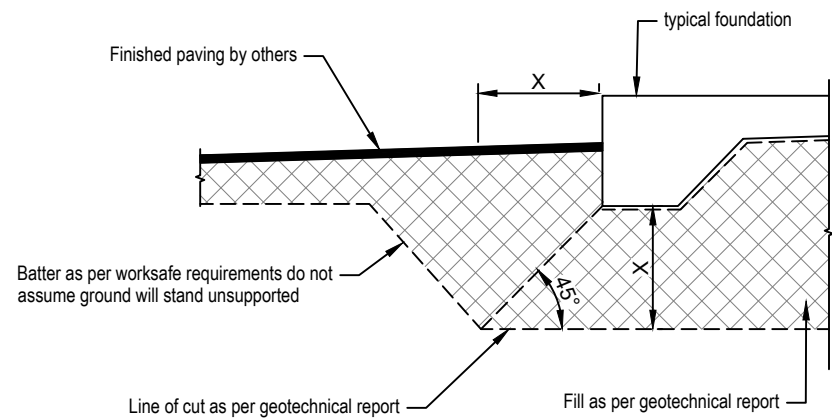
- DRAINAGE METAL SHALL BE A LAYER OF SUITABLE GRANULAR MATERIAL WITH PERFORATED PIPE TO DISCHARGE AS REQUIRED BY THE BUILDING CONSENT AUTHORITY.
- WATERPROOFING TO BE CERTIFIED BY THE SUPPLIER AND THE INSTALLER.

HARDFILL AND COMPACTION:

- CONSOLIDATE THE BASE OF ALL THE EXCAVATIONS FOR FOUNDATIONS. COMPACT THE EXPOSED SURFACE USING COMPACTING PLATE-HAMMERS OR OTHER METHODS ACHIEVE 95% OF MAX DRY DENSITY, DEFINED AT OPTIMUM WATER CONTENT, IN ACCORDANCE WITH NZS 4402.
- HARDFILL MATERIAL:
HARDFILL MATERIAL TO BE BASALTIC ROCK OR GOOD QUALITY METAL OR PUMICE SAND OR OTHER APPROVED MATERIAL, FROM AN APPROVED ORIGIN, WELL GRADED & ABLE TO BE COMPACTED TO THE TARGET DENSITY AS SPECIFIED BELOW. IT SHALL BE FREE FROM MATERIAL WHICH MAY CAUSE IT WEAVE WHEN WET
- FILL MATERIAL SHALL HAVE A MAX SIZE OF 60mm, WITH 35-55% PASSING 19mm & NOT MORE THAN 15% PASSING 600mm STANDARD SIEVES. ON SITE MEASUREMENTS SHOULD BE CONDUCTED TO DETERMINE INSITU DENSITY & MOISTURE CONTENT OF THE COMPACTED MATERIAL. DENSITY TESTING (NDM) ON EACH LAYER OF PLACED MATERIAL SHOULD BE CONDUCTED AT A SPACING OF ABOUT 10x10m GRID. NOTICE SHALL BE GIVEN TO THE ENGINEER OF WHEN DENSITY TESTING IS REQUIRED & FILLING SHALL NOT PROCEED UNTIL THE ENGINEER ADVISES THAT THE MIN DENSITY REQUIREMENTS HAVE BEEN MET. ALL FILL MATERIAL SHALL BE COMPACTED TO A MIN OF 98% MAX DRY DENSITY AS DETERMINED BY THE NZS4402 1968 TEST 4.2.2. TARGET DRY DENSITY OF COMPACTED HARDFILL SHALL BE 1.8 TONNES/M³ UNLESS OTHERWISE NOTED ON THE CONSTRUCTION ISSUE DRAWINGS.
- FILL UNDER SLABS ON GRADE:
FILL AS NECESSARY OVER THE AREA OF THE GROUND SLAB TO WITHIN 25mm OF THE UNDERSIDE OF THE SLAB WITH 150mm MIN. APPROVED FREE DRAINING TAILINGS TO A MAX DEPTH OF 800mm. A FINAL LAYER OF 25mm OF NO-FINES GRANULAR FILL SHALL BE LAID READY TO RECEIVE A DAMP PROOF MEMBRANE AS SHOWN ON THE DRAWINGS
- BACKFILL:
BEHIND RETAINING WALLS WITH APPROVED FREE DRAINING MATERIAL. REFER TO THE DRAWINGS FOR SPECIFIC REQUIREMENTS. BACKFILL AROUND FOUNDATIONS WITH APPROVED MATERIAL SUITABLE FRO THE CONDITIONS INDICATED ON THE DRAWINGS. SPECIFIC COMPACTION REQUIREMENTS TO BE IN ACCORDANCE WITH THE HARDFILL AND COMPACTION NOTES ABOVE. REMOVE ALL RUBBISH, TIMBER AND OTHER DEBRIS PRIOR TO BACK FILLING.
- FREE DRAINING BACKFILL TO BE WRAPPED IN BIDIM A19 GEOTEXTILE FILTER FABRIC OR EQUIVALENT APPROVED WITH MINIMUM 400mm LAP.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR USING TECHNIQUES AND EQUIPMENT APPROPRIATE FOR THE CONDITIONS AND SOIL/ROCK TYPES EXPECTED TO BE ENCOUNTERED ON SITE. ALL EXCAVATED MATERIAL BE DISPOSED OF IN A SUITABLE STOCKPILE FOR INCORPORATION INTO THE PROJECT EARTHWORKS OR SUBSEQUENT REMOVAL FROM SITE.

SITE EXCAVATION NOTE:

- EXTREME CARE SHALL BE TAKEN WHEN COMPLETING ANY EXCAVATIONS ON SITE. EXCAVATIONS SHALL COMPLY WITH THE WORKSAFE NZ EXCAVATION GUIDELINES, UNLESS OTHERWISE SPECIFIC WRITTEN PERMISSION IS OBTAINED FROM ENGINEER, WHO SHALL COMPLETE SITE SPECIFIC GEOTECHNICAL INVESTIGATIONS.
- EXCAVATIONS SHALL NOT UNDERMINE ANY EXISTING STRUCTURES WITHIN OR OUTSIDE THE PROPERTY BOUNDARIES. IN GENERAL A STRUCTURE IS UNDERMINED IN GOOD STIFF SOILS IF THE EXCAVATION CROSSES A 45 DEGREE (1V:1H) THRESHOLD STARTING FROM THE LOWER OUTSIDE CORNER OF THE EXISTING FOUNDATION. IN LOOSE SANDS OR POOR SOILS IT IS RECOMMENDED THIS THRESHOLD ANGLE BE DECREASED TO 30 DEGREES (1V:1.8H). NO EXCAVATIONS SHALL BE DEEPER THAN 500mm BELOW EXISTING FOUNDATION LEVEL WITHOUT PERMISSION FROM ENGINEER, AS ABOVE THRESHOLD LINES MAY DIFFER WITH DEEP EXCAVATIONS.
- EROSION CONTROL - ALL SILT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH GD05 AND PLACED PRIOR TO COMMENCEMENT OF EARTHWORKS. SUCH MEASURES SHALL BE SUBJECT TO FURTHER ADDITIONS AND ALTERATIONS, WHERE CONSIDERED NECESSARY, AS DIRECTED BY THE PROJECT MANAGER OR NRC, DURING THE PROGRESSION OF WORKS. IT IS ADVISED TO CONTACT NRC PRIOR TO COMMENCEMENT OF EARTHWORKS. AFTER INSTALLATION OF EROSION AND SEDIMENT CONTROL DEVICES TO ENSURE THEY HAVE BEEN INSTALLED TO THE SATISFACTION OF NRC.



Foundation Excavation zone

NOTE: This is a guideline only and should be read in conjunction with geotechnical report for all cut and fill requirements

MASONRY NOTES:

- CONSTRUCTION SHALL BE IN ACCORDANCE WITH NZS 4120
- RETAINING WALL BACKFILL TO BE APPROVED BY THE ENGINEER AND COMPACTED IN MINIMUM LAYERS OF 200mm THICK. ALL TOP SOIL AND ORGANICS TO BE REMOVED BELOW FOOTINGS.
- BLOCKWALL AND SLAB TO CURE 3 DAYS PRIOR TO BACKFILLING.
- MINIMUM TYPE B MASONRY BLOCK WORK TYPE AS PER NZS CRITERIA, OR OTHERWISE NOTED.
- SCABBLE THE SURFACE OF THE CONCRETE BETWEEN THE BLOCKWORK AND THE CONCRETE SLAB.
- THE FIRST (BOTTOM) BLOCK TO BE LAID UPSIDE DOWN WITH CLEAN-OUT OPENINGS (AS PER NZS 4210) FOR ALL WALLS.
- CJ = SUGGESTED CONTROL JOINT IN WALL (MARKED UP IN PLAN) D = DIAMETER OF LARGER LAPPING BAR
- REFER TO ARCHITECTURAL DRAWINGS FOR FURTHER DETAIL. THESE DRAWINGS DEMONSTRATE ENGINEERING LIMITATIONS AND DETAILS.

BOLTED SPLICE CONNECTIONS:

- UNLESS SPECIFICALLY APPROVED, ALL CRITICAL CONNECTIONS (e.g. TRANSFER BEAM, SPLICE JOINT OF BRIDGE GIRDER) AS IDENTIFIED ON THE DRAWING USING GRADE 8.8 AND SHALL BE TENSIONED BY USING ONE OF THE METHODS BELOW:
 - PART TURN METHOD:**
 - ON ASSEMBLY, ALL BOLTS IN THE CONNECTION SHALL BE FIRST TIGHTENED TO A SNUG TIGHT CONDITION. ANY BOLTS THAT BECOME LOOSE DURING THE SNUG TIGHTENING OF ADJACENT BOLTS WILL REQUIRE RE-TIGHTENING. RE-TENSIONING OF BOLTS THAT HAVE BEEN FULLY TENSIONED SHALL NOT BE PERMITTED.
 - SNUG TIGHT IS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR BY THE EFFORT OF A PERSON USING A STANDARD PODGER SPANNER.
 - AFTER COMPLETING SNUG-TIGHTENING, LOCATION MARKS SHALL BE ESTABLISHED TO MARK THE RELATIVE POSITION OF THE BOLT AND THE NUT AND TO CONTROL THE FINAL NUT ROTATION.
 - OBSERVATION OF THE FINAL NUT ROTATION MAY BE ACHIEVED BY USING MARKED WRENCH SOCKETS, BUT LOCATION MARKS SHALL BE PERMANENT WHEN REQUIRED FOR INSPECTION.
 - BOLTS SHALL BE FINALLY TENSIONED BY ROTATING THE NUT BY THE AMOUNT GIVEN IN THE TABLE BELOW. DURING THE FINAL TENSIONING, THE COMPONENT NOT TURNED BY THE WRENCH SHALL NOT ROTATE.

| BOLT LENGTH (UNDERSIDE OF HEAD TO END OF BOLT) | BOTH FACES TO BOLT AXIS |
|--|-------------------------|
| UP TO AND INCLUDING 4 DIAMETERS | ½ TURN |
| OVER 4 DIAMETERS BUT NOT EXCEEDING 8 DIAMETERS | ¾ TURN |

(ii) **DIRECT-TENSION INDICATION DEVICE:**

- ON ASSEMBLY, ALL BOLTS AND NUTS IN THE CONNECTION SHALL BE FIRST TIGHTENED TO A SNUG TIGHT CONDITION.
- AFTER COMPLETING SNUG-TIGHTENING, THE BOLT SHALL BE TENSIONED TO PROVIDE THE MINIMUM BOLT TENSION SPECIFIED IN THE TABLE BELOW. THIS SHALL BE INDICATED BY THE TENSION INDICATION DEVICE.

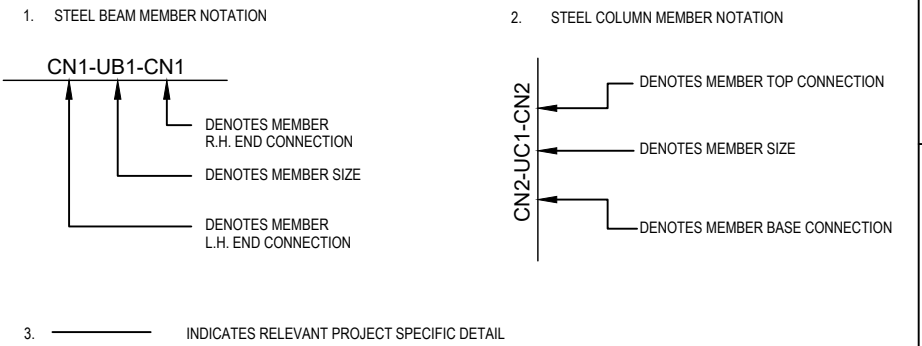
| NOMINAL DIAMETER OF A BOLT | MINIMUM BOLT TENSION, K _n |
|----------------------------|--------------------------------------|
| M16 | 95 |
| M20 | 145 |
| M22 | 180 |
| M24 | 210 |
| M30 | 335 |
| M36 | 490 |

- CONTACT AREAS BETWEEN PLATES ARE TO BE SANDBLASTED TO CLASS 2½ (SSPC SP10) AND MASKED TO PREVENT PAINTING OF THE SURFACE.
- PAINTING OVER AND AROUND THE CONNECTION TO BE IN ACCORDANCE WITH THE PAINTING SPECIFICATION NOTES.
- ALL INTERIOR STRUCTURAL STEEL TO BE COATED WITH CARBOZINC 11 COATING SYSTEMS AS PER MANUFACTURERS DETAILS.

STEELWORK NOTES:

- ALL MATERIALS, FABRICATION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NZS 3404 AND AS/NZS 1554, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
- UNLESS OTHERWISE NOTED, ALL STEEL SHALL BE IN ACCORDANCE WITH:
 - AS/NZS 3679.1 GRADE FOR BHP-300 PLUS ROLLED SECTIONS AND MERCHANT BAR, EXCEPT WHERE NOTED.
 - AS/NZS 3679.2 GRADE 300 FOR ALL WELDED SECTION (WB & WC)
 - AS 1163 GRADE C350 FOR RECTANGULAR HOLLOW SECTIONS
 - AS 1163 GRADE C350 FOR CIRCULAR HOLLOW SECTIONS (EXTRA LIGHT WALL)
 - AS 1163 GRADE C350 FOR CIRCULAR HOLLOW SECTIONS (MEDIUM AND HEAVY)
- UNLESS OTHERWISE NOTED, ALL STEEL SHALL BE IN ACCORDANCE WITH:
 - THE CONTRACTOR SHALL PREPARE WORKSHOP DRAWINGS AND SUBMIT COPIES OF EACH DRAWING FOR REVIEW. ALLOW 7 DAYS FOR SHOP DRAWING REVIEW. FABRICATION SHALL NOT COMMENCE UNTIL REVIEW HAS BEEN COMPLETED. REVIEW DOES NOT INCLUDE DIMENSIONS.
 - HIGH STRENGTH STRUCTURAL BOLTS AND WASHES SHALL COMPLY WITH AS1252 & NZS 3404.
 - WELDING:
 - WELDING TO BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE NZS 3404 AND NZS/AS 1554.1 UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS ALL WELDS SHALL BE CATEGORY SP (STRUCTURAL PURPOSE) E41XX/W40X 6mm FWAR IN ACCORDANCE WITH NZS/AS 1554.1, UNO.
 - STEEL FABRICATOR SHALL PROVIDE THE ENGINEER WITH ONE COPY OF THEIR WELD PROCEDURE PRIOR TO COMMENCE WELDING.
 - ALL WELDING SHALL BE A MINIMUM OF 6mm CFW UNLESS NOTED OTHERWISE.
 - ALL ELECTRICALLY DISSIMILAR CONSTRUCTION MATERIALS EG. STAINLESS STEEL AND CARBON STEEL SHALL BE ISOLATED BY MEANS OF NYLON WASHERS AND/OR GROMMETS.
 - PERIODIC MAINTENANCE (IF APPLICABLE) IS TO BE CARRIED OUT AS PER THE MAINTENANCE SCHEDULE AND PAINTING SPECIFICATIONS.
 - PAINTING IS TO BE CARRIED OUT BY THE PROJECT SPECIFIC STRUCTURAL STEEL PAINTING SPECIFICATION.

STEEL WORK LEGEND:



| | | | | | |
|--|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |
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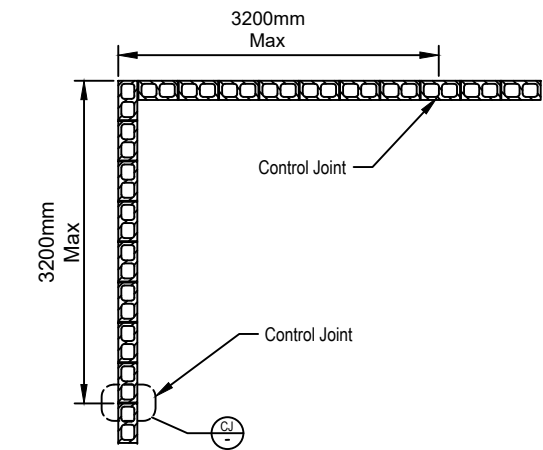
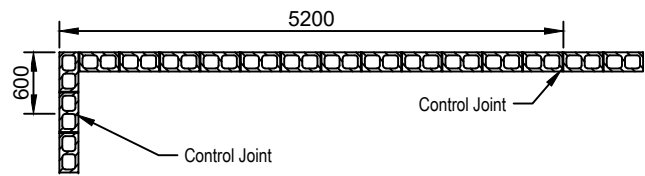
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Client: HUGH JOHNSTONE
 Project Title: HUGH JOHNSTONE 142 KONINI ROAD, AUCKLAND - SED

Sheet Title: STANDARD NOTES SHEET 02

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | SN2 | Sheet #: | 01 |



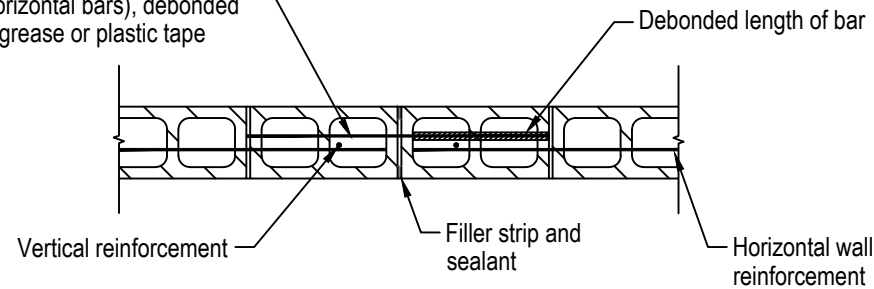
Control Joint Location

Scale: 1:75

Shrinkage control joints:
Longitudinal shrinkage stresses in concrete masonry shall be controlled by providing vertical control joints at not more than 6m CRS.

- Vertical control joints shall be located:
- (A) Within 600mm of return angles in T and U shaped floor structures.
 - (B) Within 600mm of L-shaped corners or by restricting the spacing to the next control joint to 3.2 Max
 - (C) At changes in wall height, exceeding 600mm
 - (D) At changes in wall thickness

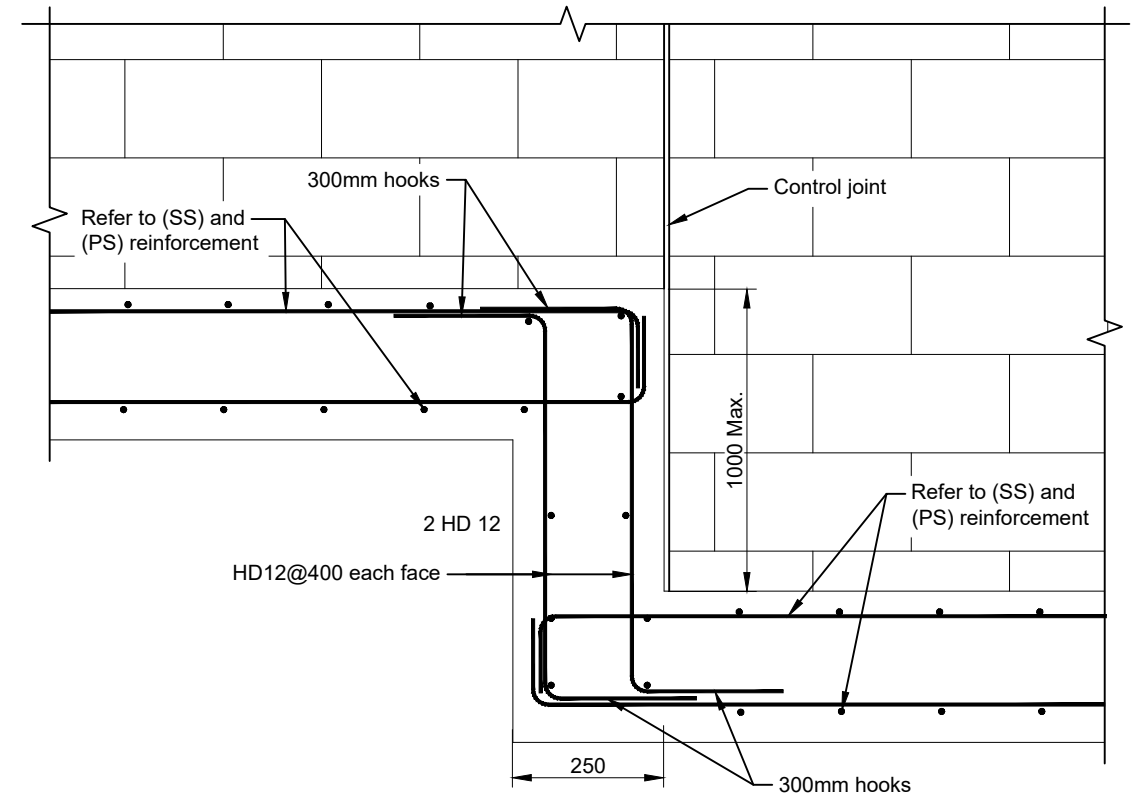
HR16 lapping bars 800 long (at the same spacing as the horizontal bars), debonded on one side with grease or plastic tape



Control joint detail for solid-filled walls and partially filled walls where horizontal bars are placed between floors but not bond beams.

CJ - Vertical control joint detail

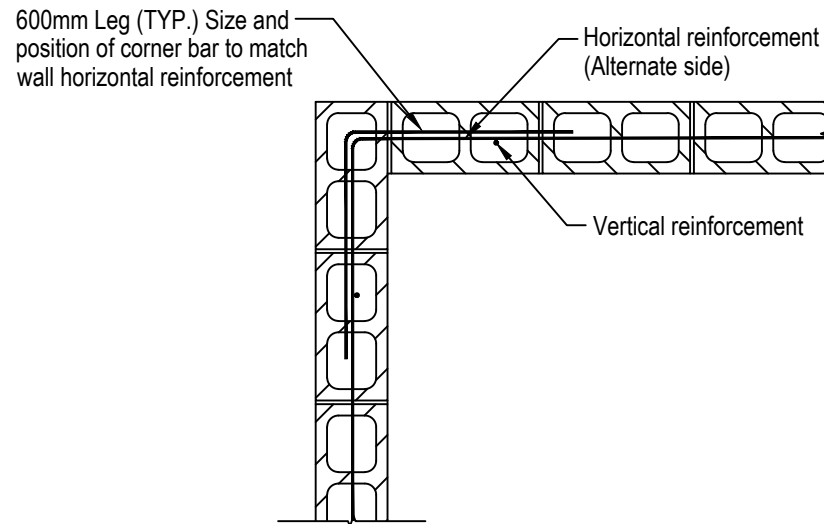
Scale: 1:20



CJ & S - 1000mm Max. Block wall step foundation

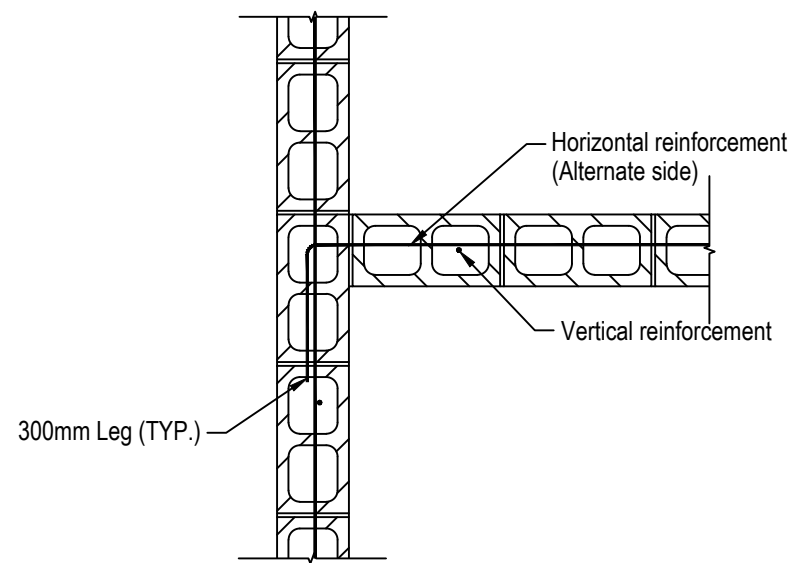
(if required at construction)

Scale: 1:20



Typical masonry wall corner

Scale: 1:20

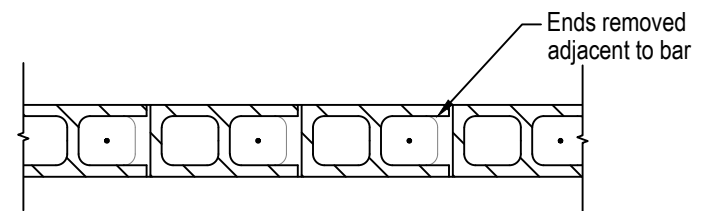


Typical masonry wall intersection

Scale: 1:20

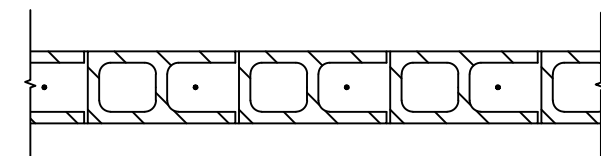
NOTE:

For 20 Series block walls with H20 starters
Type 20.05 Open end blocks to be used or
Type 20.15 with ends removed



Type 20.15

Scale: 1:20



Type 20.05

Scale: 1:20

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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Client:
HUGH JOHNSTONE



Project Title:
HUGH JOHNSTONE 142
KONINI ROAD, AUCKLAND -
SED

Sheet Title:
STANDARD MASONRY DETAILS

Job #:
24106

Client Drawing #:
SMD

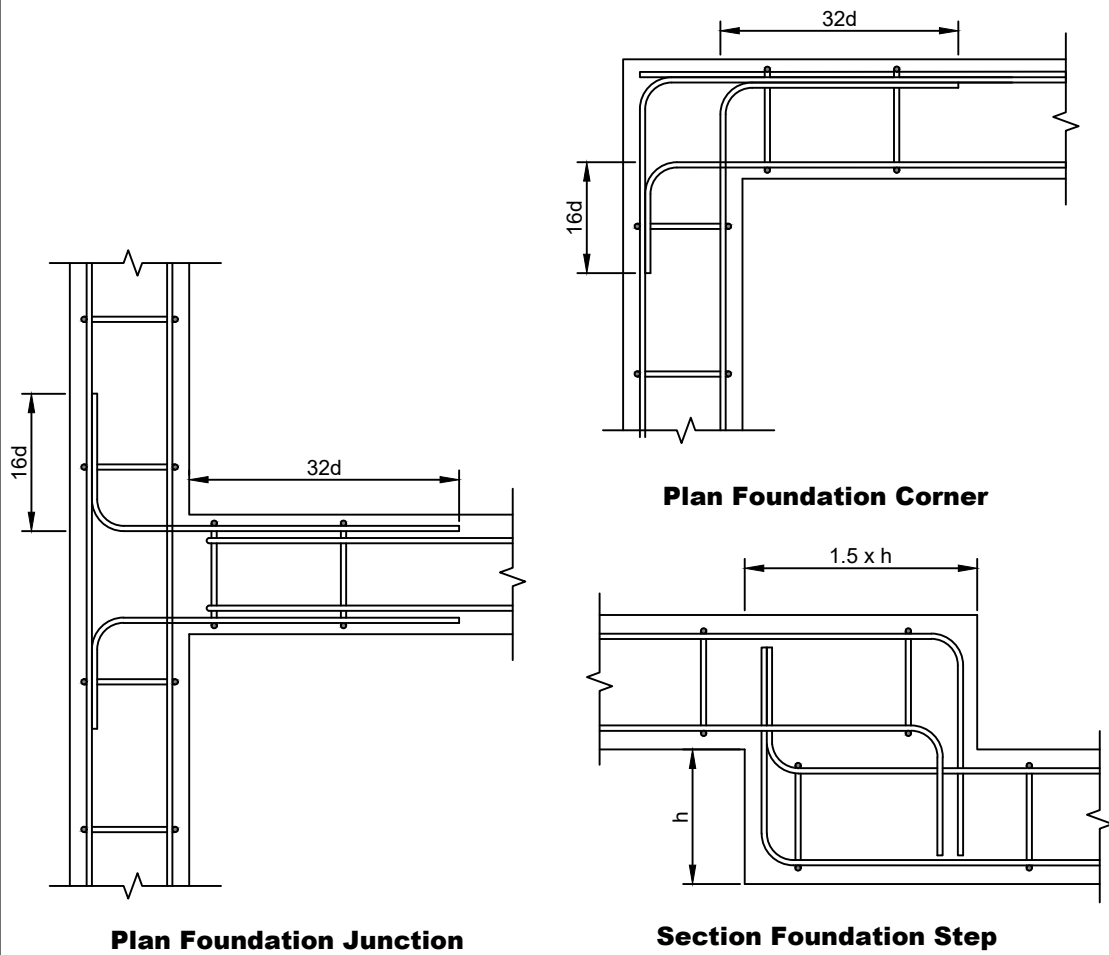
Scale (A3 Original):
As Shown

Sheet #:
SMD

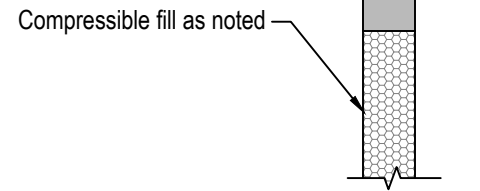
Rev No:
01

NOTE: Applicable to simple foundations only.
Foundation beam systems have specific detailing.

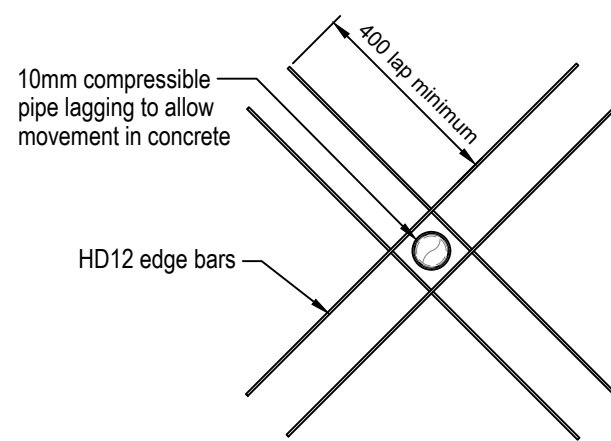
d = bar diameter



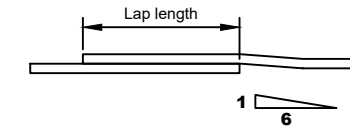
Compressible fill to be cut back when concrete had cured and have gap filled with an approved sealant



Standard Column Isolation Joint (IJ) Finishing



Typical Slab Isolated Penetration Detail



| Bar Diameter (mm) | Concrete Strength (Mpa) | | | | |
|-------------------|-------------------------|------|------|------|-----|
| | 20 | 25 | 30 | 35 | 40 |
| 10 | 350 | 300 | 275 | 275 | 250 |
| 12 | 425 | 375 | 350 | 325 | 300 |
| 16 | 550 | 500 | 450 | 425 | 400 |
| 20 | 675 | 600 | 550 | 525 | 475 |
| 25 | 850 | 750 | 700 | 650 | 600 |
| 32 | 1075 | 975 | 900 | 825 | 775 |
| 40 | 1350 | 1200 | 1100 | 1025 | 950 |

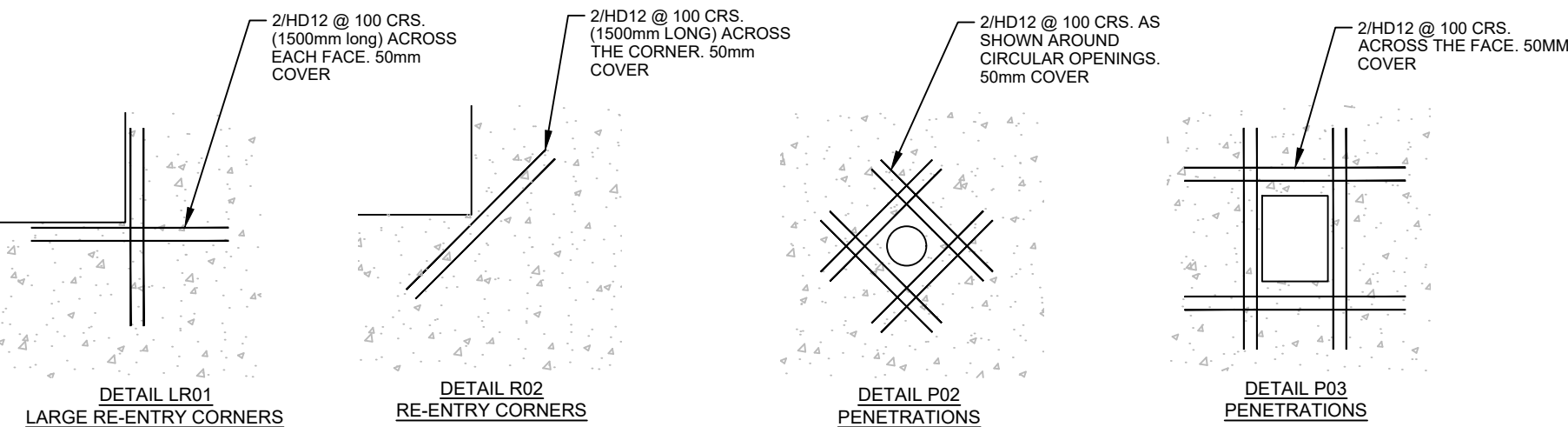
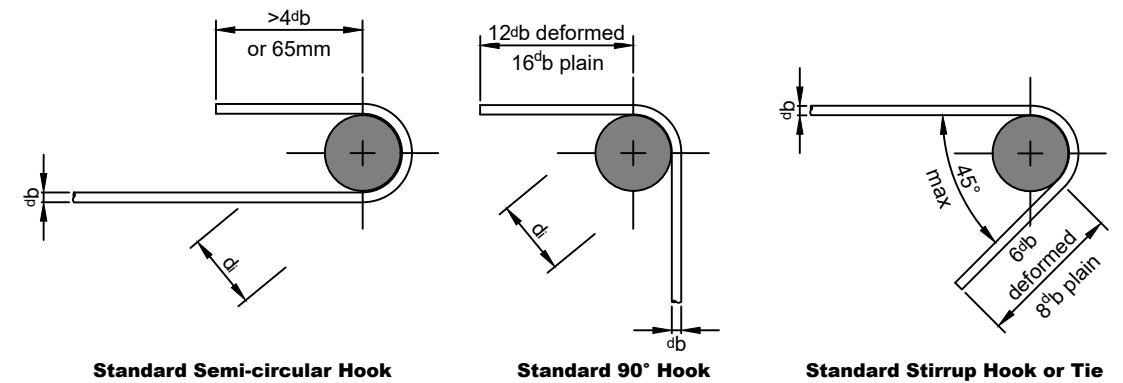
NOTE

- All reinforcing hooks, bends and lap lengths to comply with NZS 3101.

| Bar Diameter (mm) | Concrete Strength (Mpa) | | | | |
|-------------------|-------------------------|------|------|------|------|
| | 20 | 25 | 30 | 35 | 40 |
| 10 | 550 | 500 | 450 | 425 | 400 |
| 12 | 675 | 600 | 550 | 500 | 475 |
| 16 | 900 | 800 | 725 | 675 | 625 |
| 20 | 1125 | 1000 | 925 | 850 | 800 |
| 25 | 1400 | 1250 | 1150 | 1050 | 1000 |
| 32 | 1800 | 1600 | 1450 | 1350 | 1275 |
| 40 | 2225 | 2000 | 1825 | 1700 | 1575 |

Standard reinforcing lap lengths

For pour lengths less than 300mm multiply by 1.3 for pour depths greater than 300mm



CONCRETE SLAB RETURN BARS

Scale 1:50 on A3

| f _t (MPa) | Reinforcing Bar type | Bar Diameter ^d b (mm) | Minimum Diameter bend d _i (mm) | |
|----------------------|----------------------|----------------------------------|---|------------------|
| | | | Plain Bars | Deformed Bars |
| 300 or 500 | Main Bar | 6-20 | 5 ^d b | |
| | | 24-40 | 6 ^d b | |
| | Stirrups & Ties | 6-20 | 2 ^d b | 4 ^d b |
| | | 24-40 | 3 ^d b | 6 ^d b |

NOTE

- Where deformed bars are galvanized before bending, the minimum bend diameter shall be :
 - (A) 5^db for bar diameters of 16mm or less.
 - (B) 8^db for bar diameters of 20mm or greater.

Standard reinforcing hooks and bends

| | | | | | |
|----------------|-----|------------------|-------------|---------------|--|
| Surveyed: LOSC | | | | | |
| Designed: PW | | | | | |
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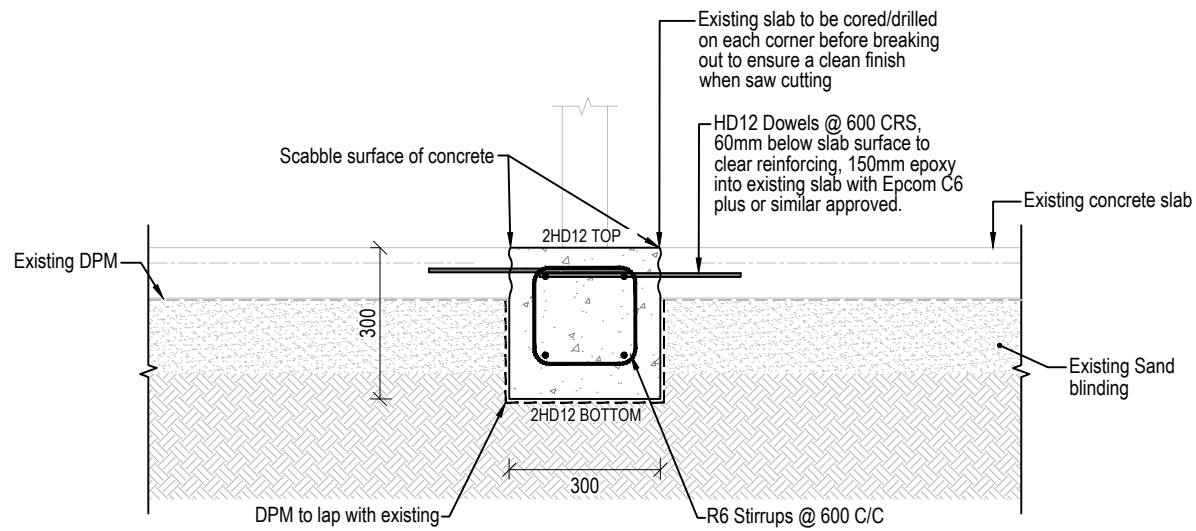
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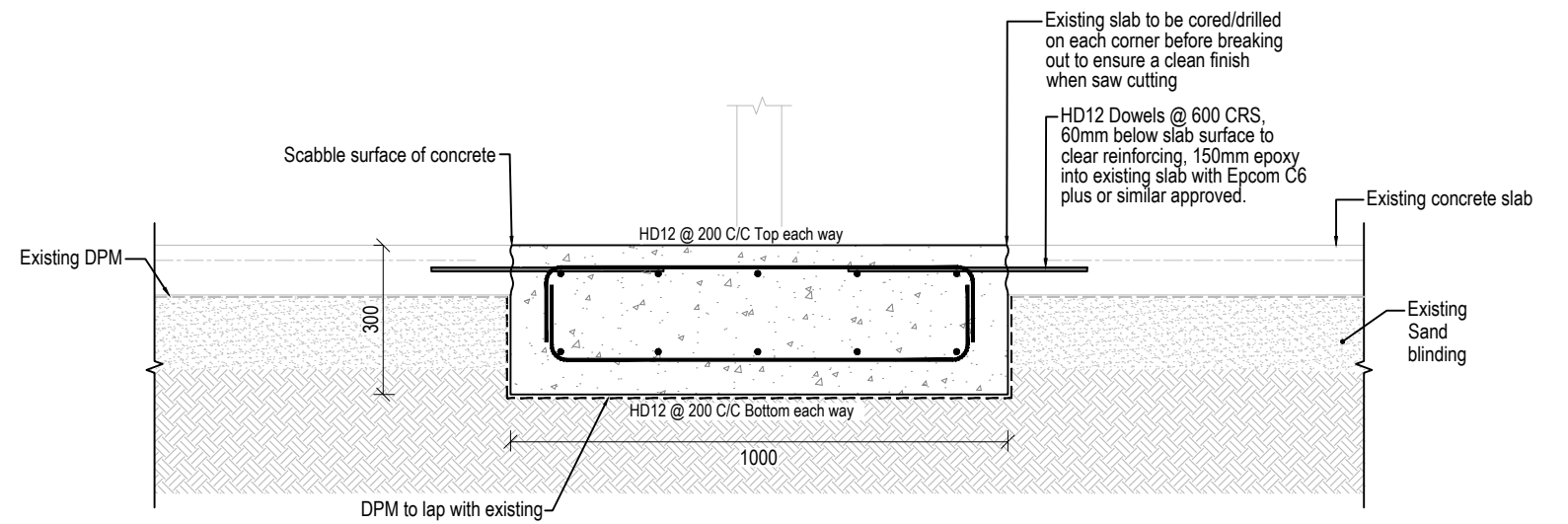
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Project Title: HUGH JOHNSTONE 142 KONINI ROAD, AUCKLAND - SED

Sheet Title: STANDARD CONCRETE DETAILS

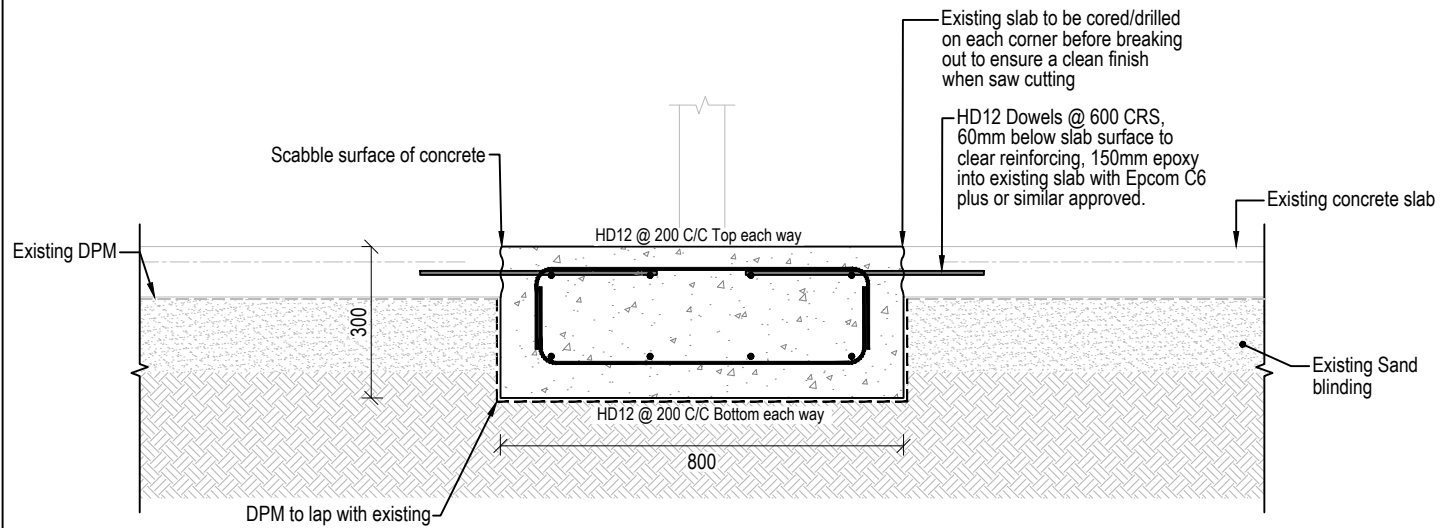
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| Client Drawing #: | Sheet #: SCD |
| | Rev No: 01 |



G1 FOOTING TYPE - G1
Scale 1:15



F1 FOOTING TYPE - F1
Scale 1:15



G2 FOOTING TYPE - G2
Scale 1:15

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
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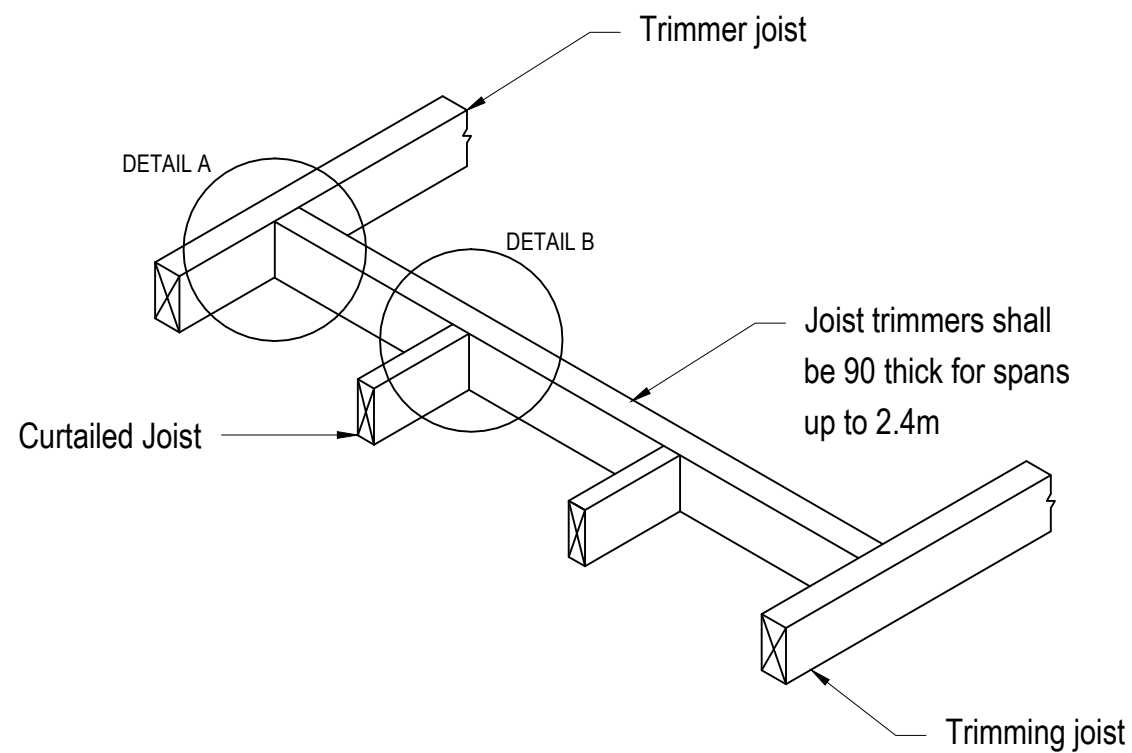
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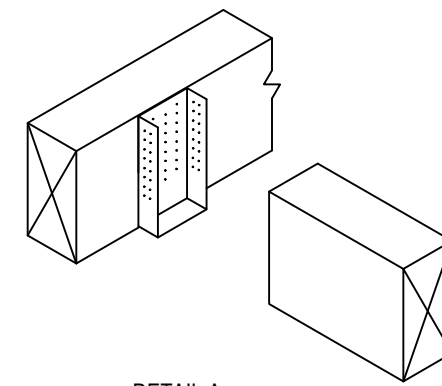
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Project Title:
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KONINI ROAD, AUCKLAND -
SED

Sheet Title:
SLAB JOINT AND CONCRETE
FOOTING DETAILS

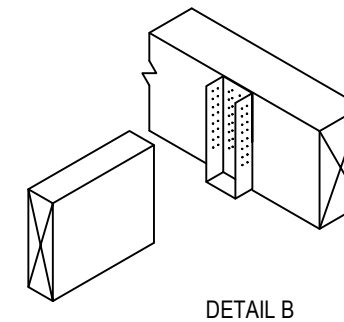
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| Job #: | 24106 | | Scale (A3 Original): | As Shown |
| Client Drawing #: | Sheet #: | Rev No.: | | |
| | F01 | 01 | | |



01 **GENERAL TRIMMER LAYOUT**
Scale 1:15



02 **TRIMMER TO TRIMMER JOIST DETAIL**
Scale 1:15



03 **TRIMMER TO CURTAILED JOIST DETAIL**
Scale 1:15

| | | | | | |
|---|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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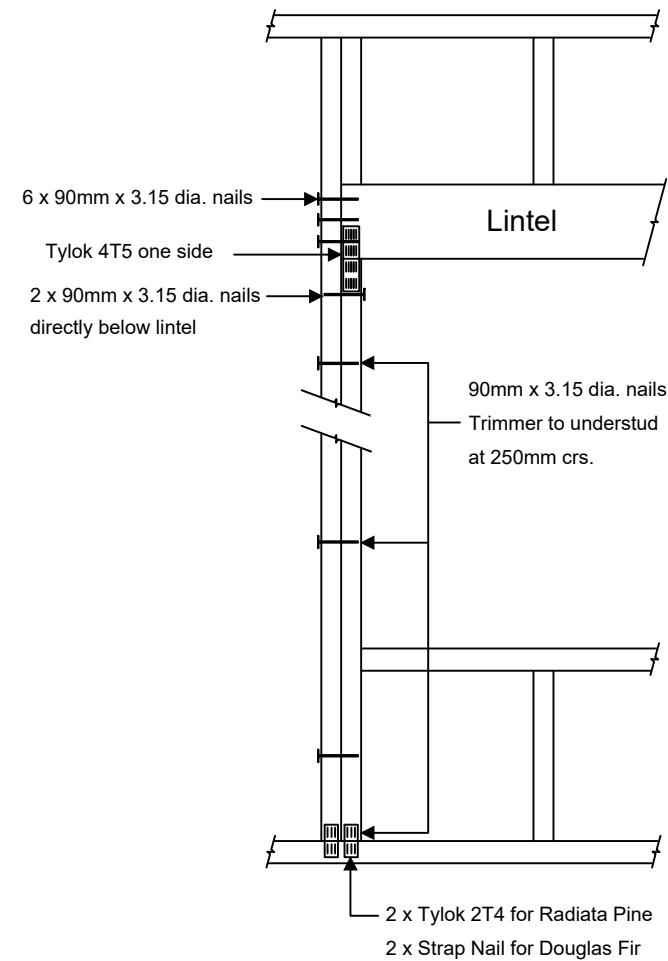
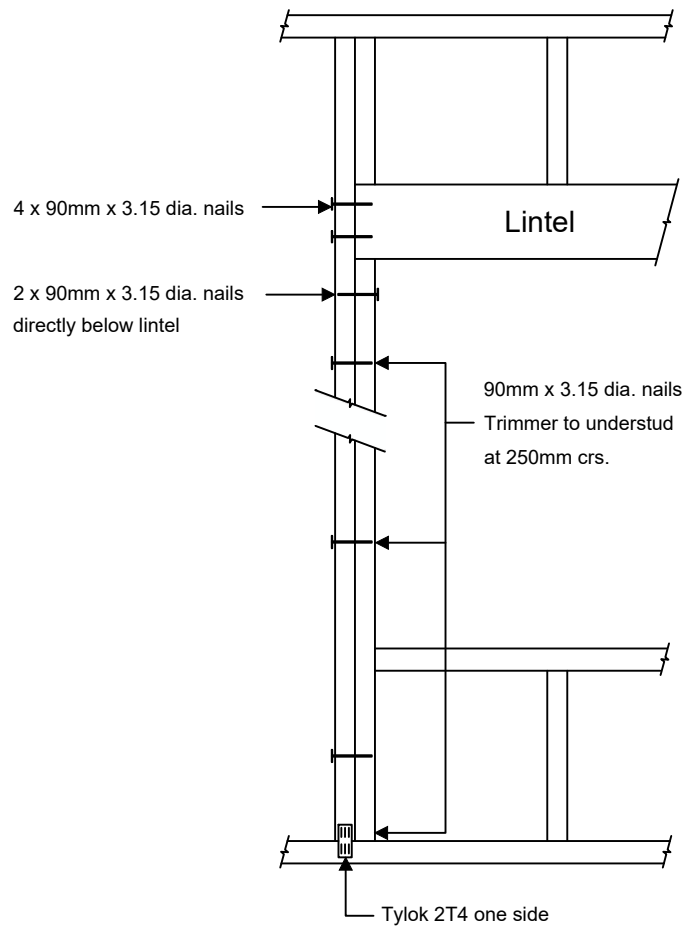


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Project Title:
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Sheet Title:
TIMBER JOIST CONNECTION
DETAILS

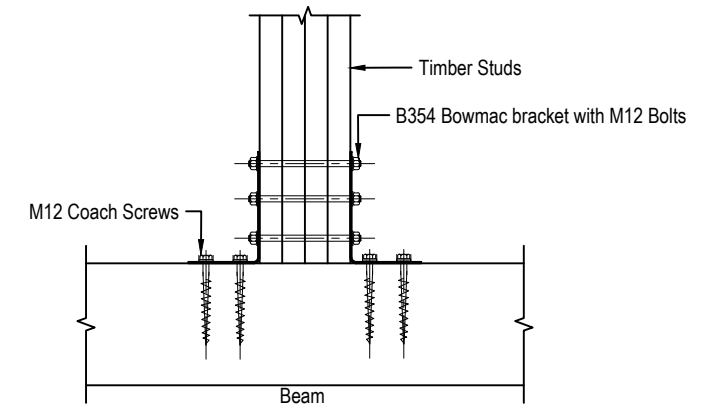
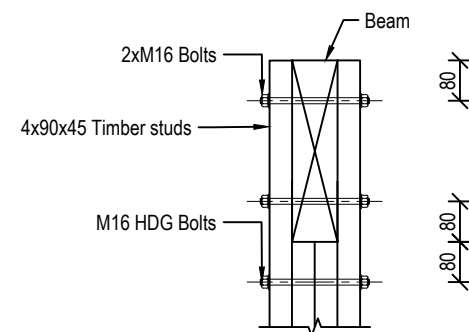
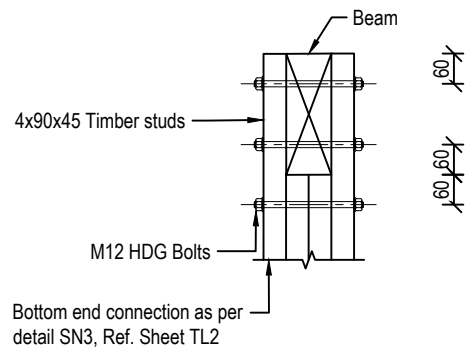
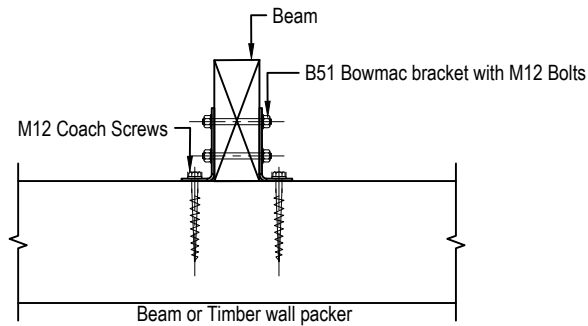
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| Job #: | 24106 | | Scale (A3 Original): | As Shown |
| Client Drawing #: | Sheet #: | Rev No.: | | |
| | TJ | 01 | | |

Note:
Stud Numbers indicatively only Refer
to Table 8.5 NZS 3604:2011 and plan
drawing stud number call ups.



01 - **SNO DETAIL**
TOP & BOTTOM ACCEPTABLE SUPPORT LAYOUTS
Scale 1:10

02 - **SN1 DETAIL**
TOP & BOTTOM SUPPORT ACCEPTABLE LAYOUTS
Scale 1:10



03 - **SN3 ALTERNATIVE DETAIL - 03**
(FOR INTERSECTING BEAMS)
Scale 1:15

04 - **SN3 ALTERNATIVE DETAIL - 04**
(FOR INTERSECTING WALLS)
Scale 1:15

05 - **SN4 ALTERNATIVE DETAIL - 05**
(FOR INTERSECTING WALLS)
Scale 1:15

06 - **SN4 ALTERNATIVE DETAIL - 06**
(FOR INTERSECTING BEAMS)
Scale 1:15

| | | | | | |
|--|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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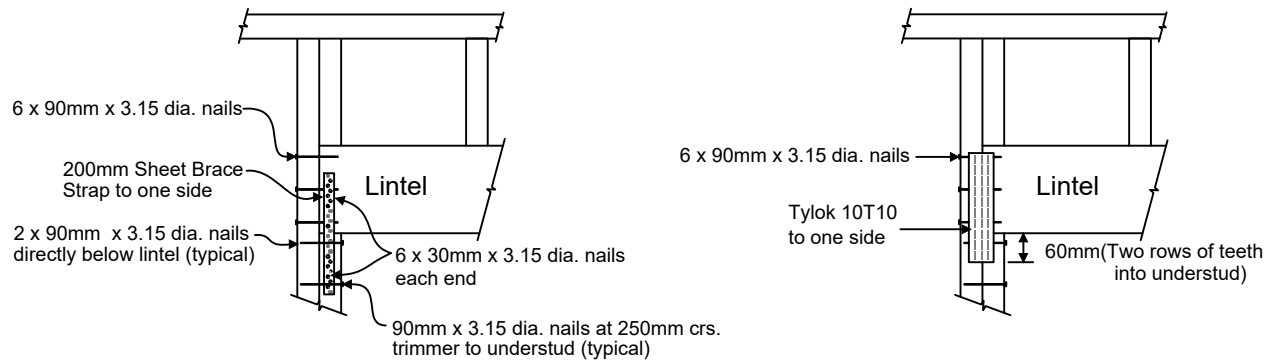


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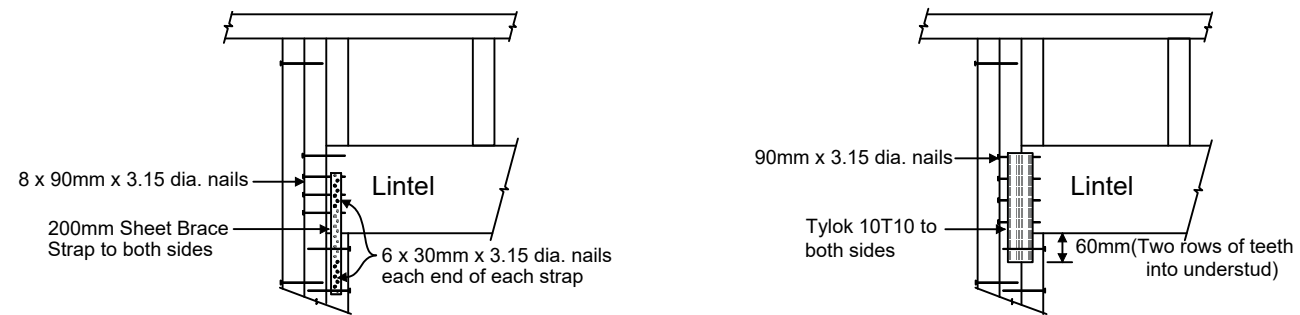
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TIMBER LINTEL DETAILS
SHEET 01

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| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | | Sheet #: | TL1 |
| | | Rev No.: | 01 |

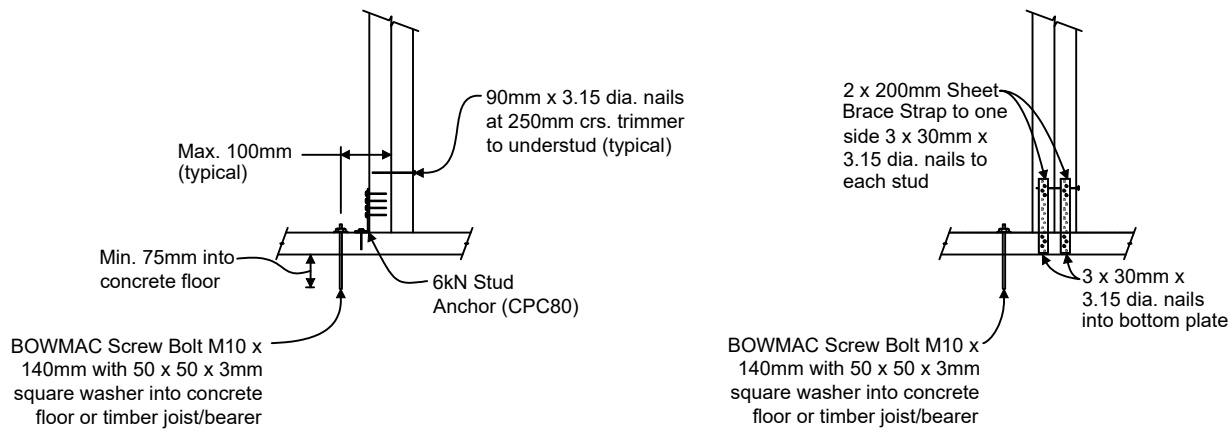
Note:
Stud Numbers indicatively only Refer
to Table 8.5 NZS 3604:2011 and plan
drawing stud number call ups.



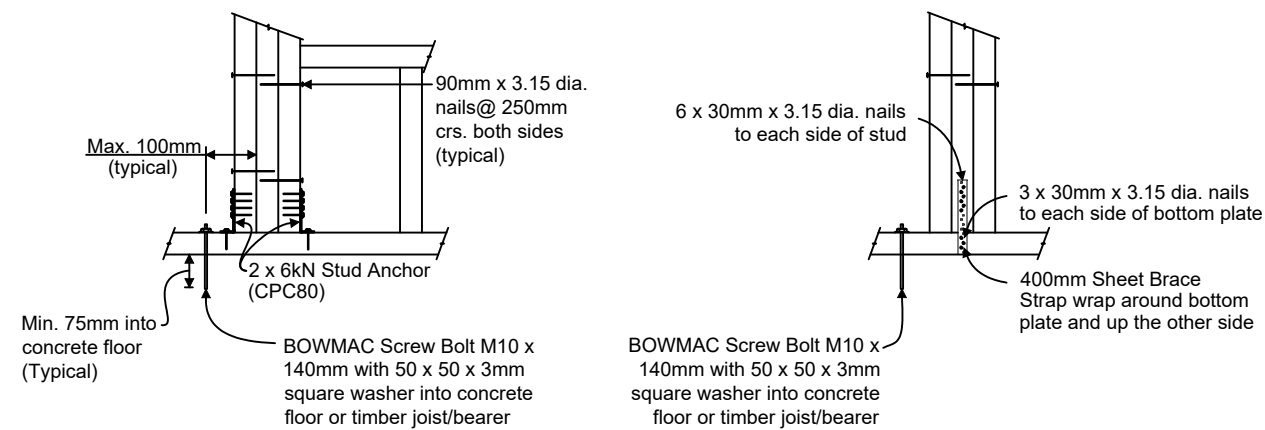
02A **SN2 DETAIL - TOP SUPPORT ACCEPTABLE LAYOUTS**
Scale 1:15



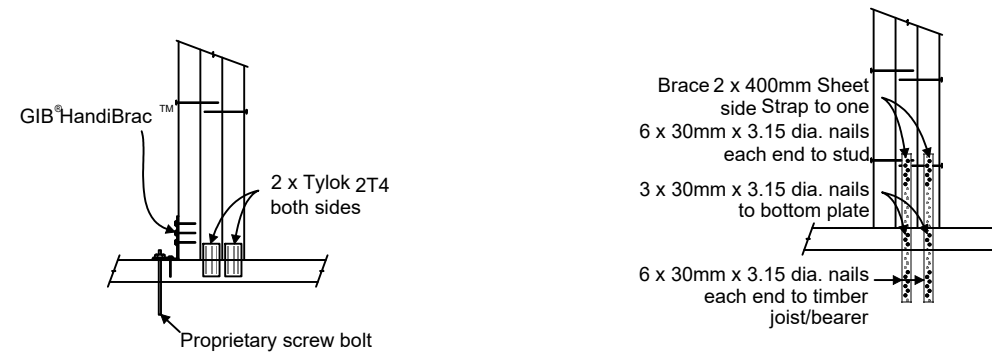
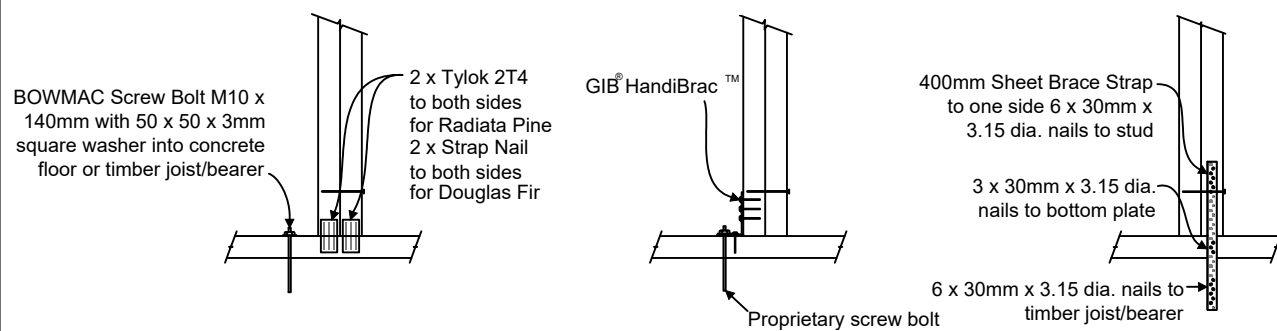
03A **SN3 DETAIL - TOP SUPPORT ACCEPTABLE LAYOUTS**
Scale 1:15



02B **SN2 DETAIL - ACCPETABLE BOTTOM SUPPORT LAYOUTS**
Scale 1:15



03B **SN3 DETAIL - BOTTOM SUPPORT ACCEPTABLE LAYOUTS**
Scale 1:15



| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |

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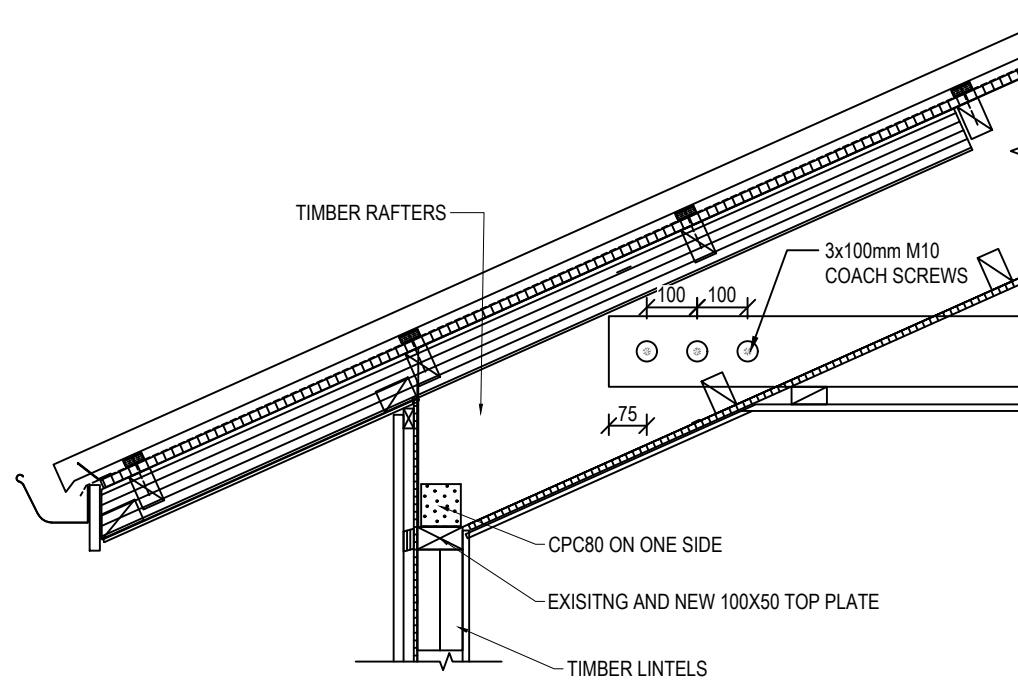
Project Title:
HUGH JOHNSTONE 142
KONINI ROAD, AUCKLAND -
SED

Sheet Title:
TIMBER LINTEL DETAILS
SHEET 02

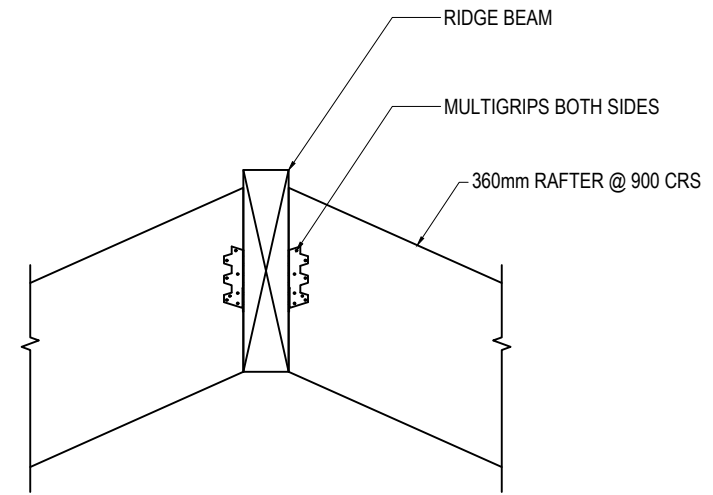
Job #:
24106
Scale (A3 Original):
As Shown

Client Drawing #:
Sheet #:
Rev No:
TL2 01

Note:
Stud Numbers indicatively only Refer
to Table 8.5 NZS 3604:2011 and plan
drawing stud number call ups.



05 **SN5 DETAIL - RAFTER TO TOP PLATE CONNECTION**
Scale 1:15



06 **SN6 DETAIL - RAFTER TO RIDGE BEAM CONNECTIONS**
Scale 1:15

| | | | | | |
|---|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |
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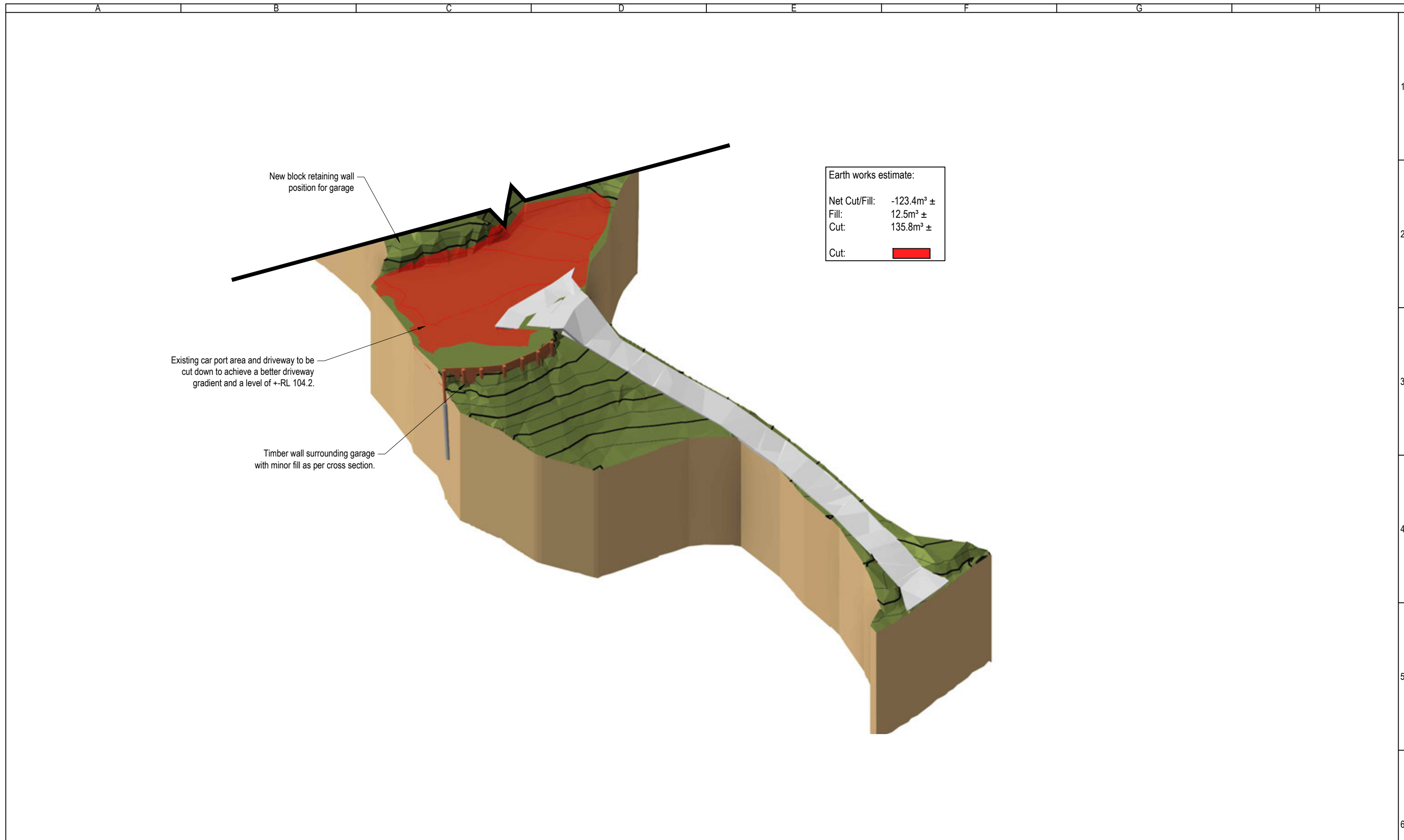
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Project Title:
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Sheet Title:
TIMBER LINTEL DETAILS
SHEET 03

| | | | | |
|-------------------|----------|----------|----------------------|----------|
| Job #: | 24106 | | Scale (A3 Original): | As Shown |
| Client Drawing #: | Sheet #: | Rev No.: | | |
| | TL3 | 01 | | |



Important Note:
 The 3D drawing is for illustration only. It may not be to scale or accurate. For instance indicative timber retaining wall position, driveway heights and positioning, ground slopes and illustrative cut area position/size etc.

ILLUSTRATIVE EXCAVATION AMOUNT NEAR GARAGE
 Scale : NTS

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |

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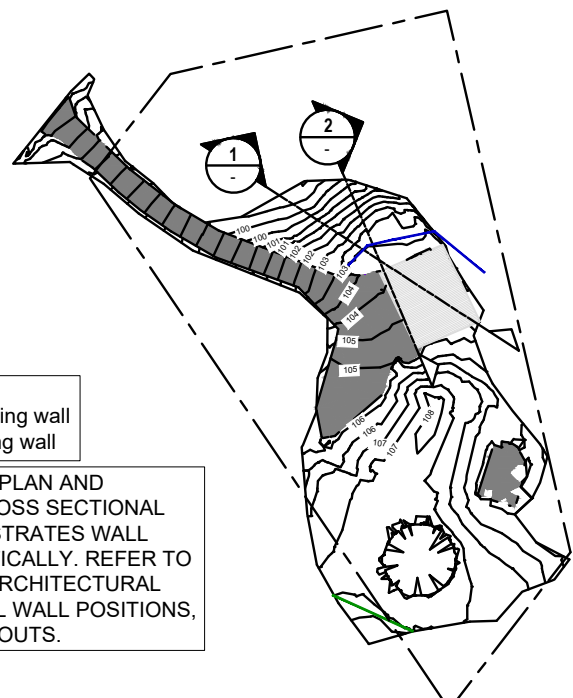
Client:
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 Project Title:
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 SED

Sheet Title:
 EARTH WORKS SITE PLAN AND 3D

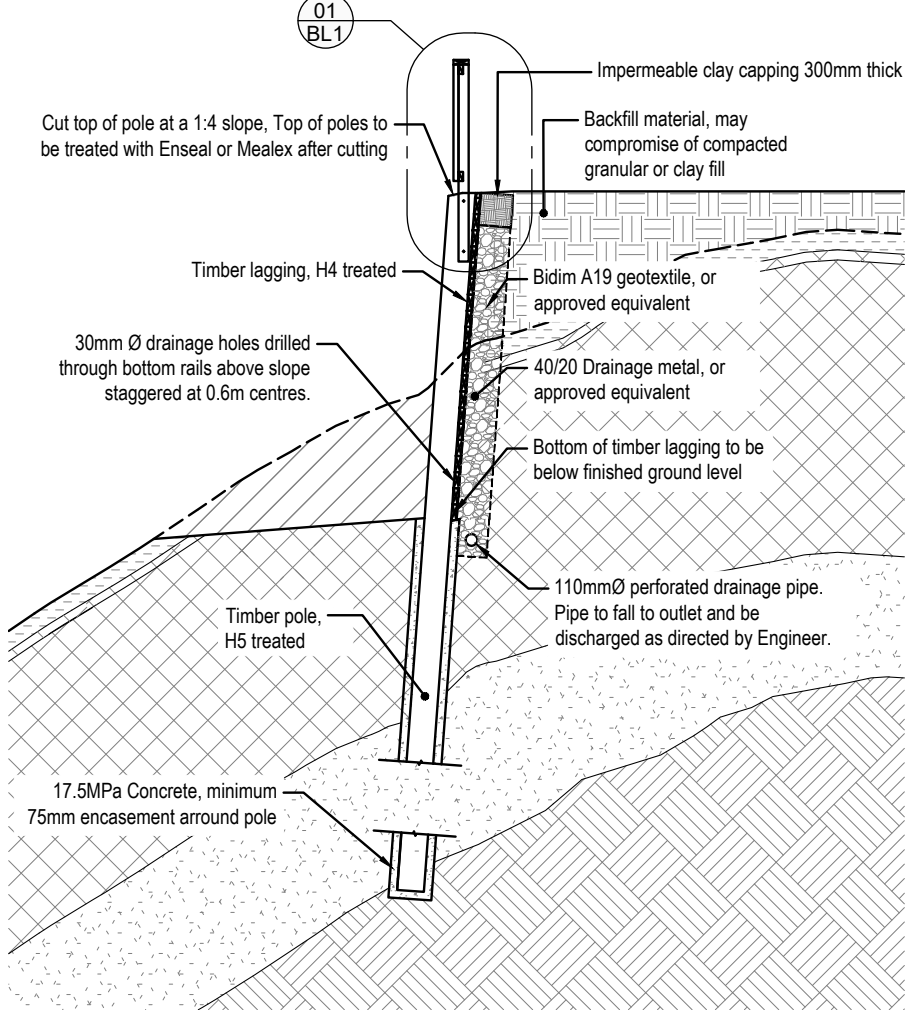
| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | E01 | Sheet #: | 01 |

KEY:
 - - - : Timber retaining wall
 - - - : Block retaining wall

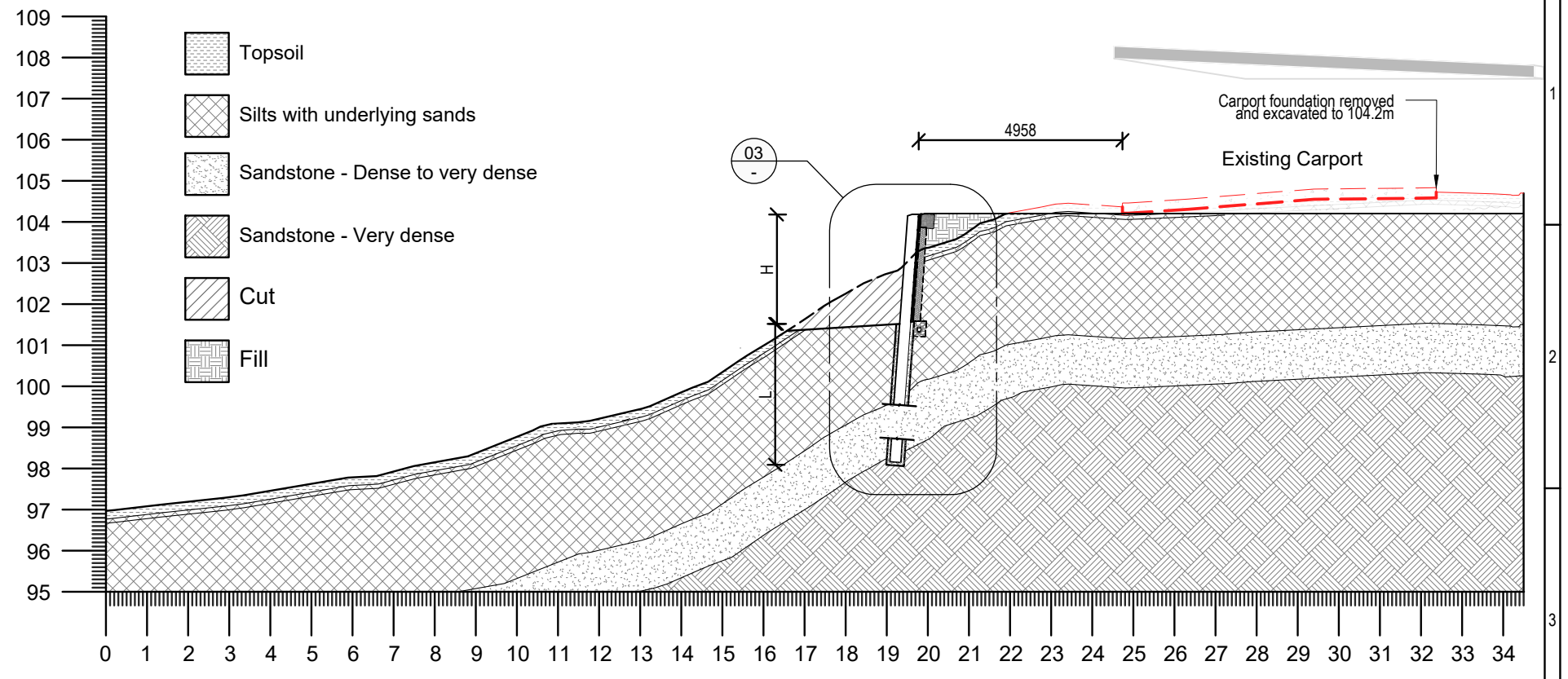
NOTE: THIS SITE PLAN AND ASSOCIATED CROSS SECTIONAL DRAWINGS ILLUSTRATES WALL TYPES SCHEMATICALLY. REFER TO THE FINALIZED ARCHITECTURAL PLANS FOR FINAL WALL POSITIONS, LEVELS AND LAYOUTS.



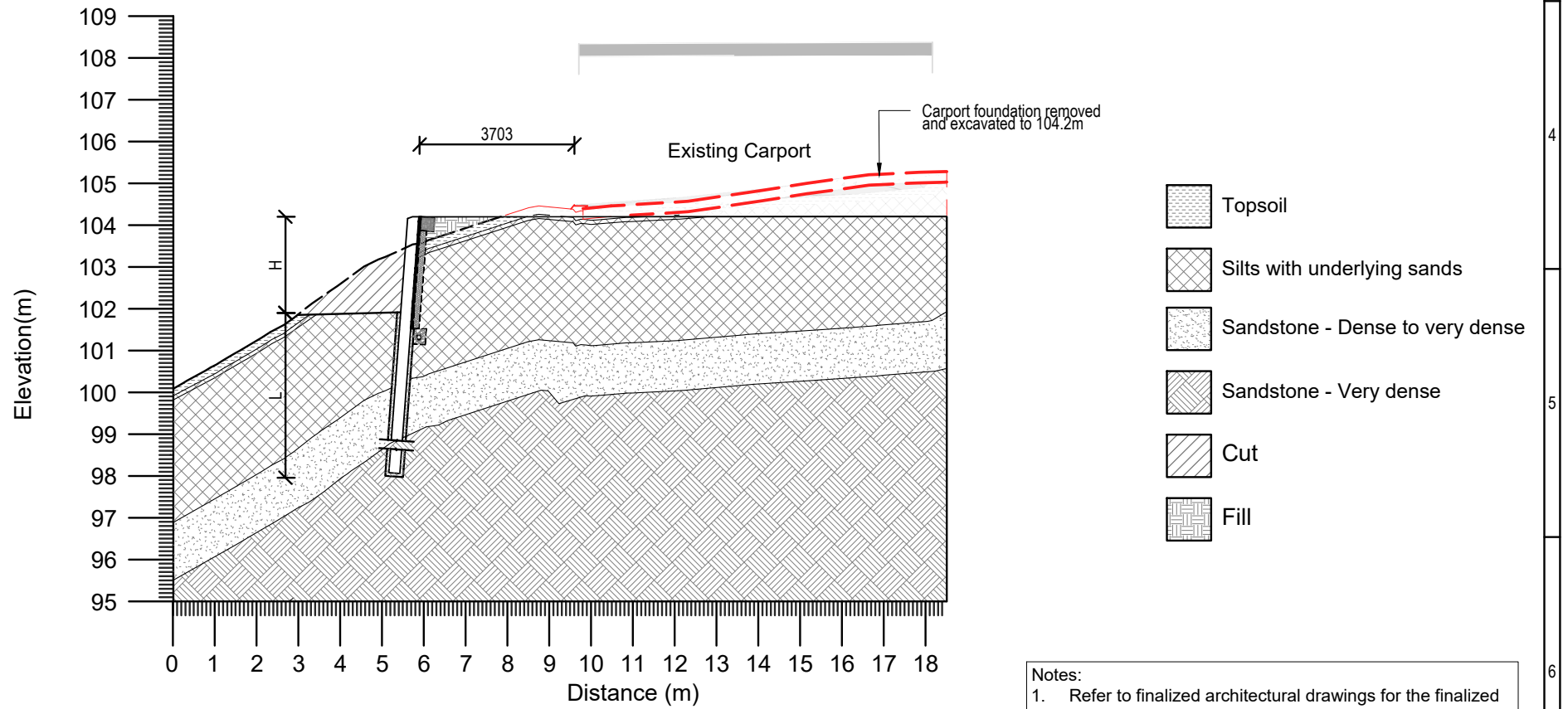
01 SITE PLAN
 Scale 1:750



03 TIMBER RTW CALLOUT
 Scale 1:75



01 SECTION 01
 Scale 1:150



02 SECTION 02
 Scale 1:150

Notes:
 1. Refer to finalized architectural drawings for the finalized wall positions, levels and layout.
 2. Refer to Drawing T02 for pole size, depths and spacing.

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | 02 | FOR CONSENT | PW | APRIL 2025 |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |

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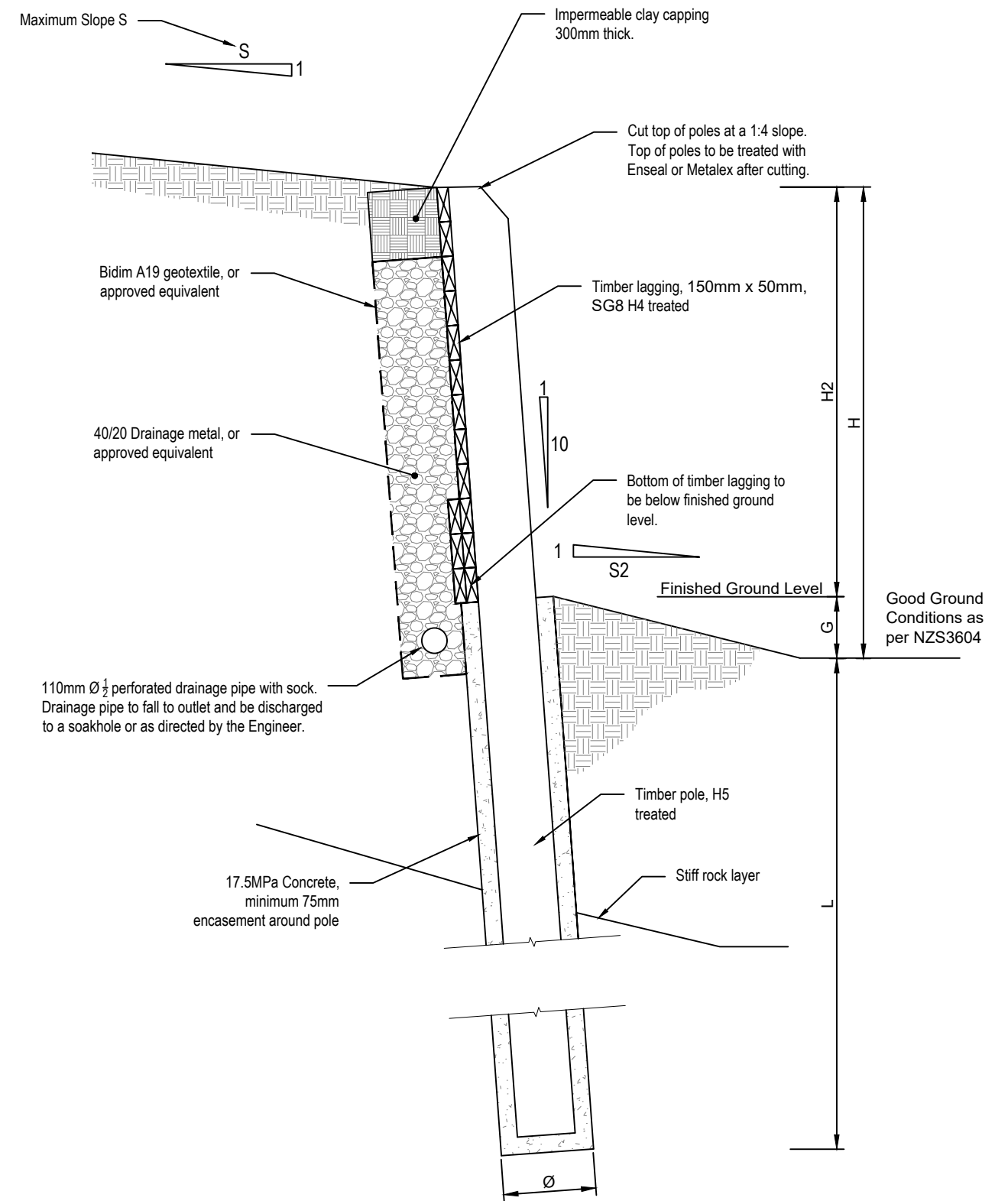
Sheet Title: TIMBER RETAINING WALL & GEOLOGICAL PROFILE SECTIONS

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | T01 | Sheet #: | 02 |

Notes:

1. Timber lagging to be 50mm thick from top of wall to 1.4m below top of retaining wall. Lower positioned timber lagging shall be 2 x 50mm boards thick from 1.4m below top of wall. All boards are to be No 1 Framing Grade.
2. All poles are normal density except for HD marked poles(if applicable) which are high density strength (tested for 52MPa)
3. Safety Rail/Fence 1.1m high to retained areas(H2) over 1.0m high as per NZBC F4 by others (proprietary product). Design heights over 1m high may not be applicable. Review architectural drawings.
4. All fixings to be SS304
5. *Estimate depth to good ground conditions as per NZS3604 based on the site's geotechnical report/testing. The Contractor must feed back photos to Engineer for review to verify depth of organics. If there is any deeper organics found on site contact the Engineer. The areas may be filled with granular fill in layers of 200mm thick, compacted and tested OR timber poles may need to be extended deeper.
6. Refer to architectural drawings for retaining heights and wall positions.
7. Engineering inspections are required for the embedment of poles to verify ground conditions prior to placing the poles into the hole and pouring concrete.

| TIMBER RETAINING WALL AT GARAGE | | | | | | |
|---|-------------|------|------|------|------|------|
| Timber Pole Retaining Wall Type (See Plan Drawings) | Wall Type 1 | | | | | |
| Retained Height H2 (mm) | 2600 | 2400 | 2000 | 1600 | 1200 | 800 |
| Pole diameter SED (mm) | 325 | 300 | 275 | 225 | 175 | 150 |
| Pole spacing SP (mm) | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 |
| *Estimated depth to "good ground" to be verified during construction G (mm) | 0 | 0 | 0 | 0 | 0 | 0 |
| Embedment Depth L (mm) | 4800 | 4400 | 3800 | 3000 | 2300 | 1600 |
| Maximum retained height H2+G=H (mm) | 2600 | 2400 | 2000 | 1600 | 1200 | 800 |
| Total Pole Length H+L (mm) | 7400 | 6800 | 5800 | 4600 | 3500 | 2400 |
| Timber lagging thickness (mm) | *See Note 1 | | | 50 | 50 | 50 |
| Minimum concrete diameter if applicable (mm) | 600 | 600 | 600 | 450 | 450 | 350 |
| Minimum design front slope | 1:3 | 1:3 | 1:3 | 1:3 | 1:3 | 1:3 |
| Maximum design back slope S (ratio) | 1:10 | 1:10 | 1:10 | 1:10 | 1:10 | 1:10 |
| Design surcharge (kpa), Static Load | 5kpa | 5kpa | 5kpa | 5kpa | 5kpa | 5kpa |



TYPICAL RTW AT GARAGE (SECTION A - A)
Scale 1:25

| | | | | | |
|----------------|-----|------------------|-------------|---------------|--|
| Surveyed: LOSC | | | | | |
| Designed: PW | | | | | |
| Drawn: JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 | |
| Checked: PW | Rev | Revision Details | Approved by | Date | |

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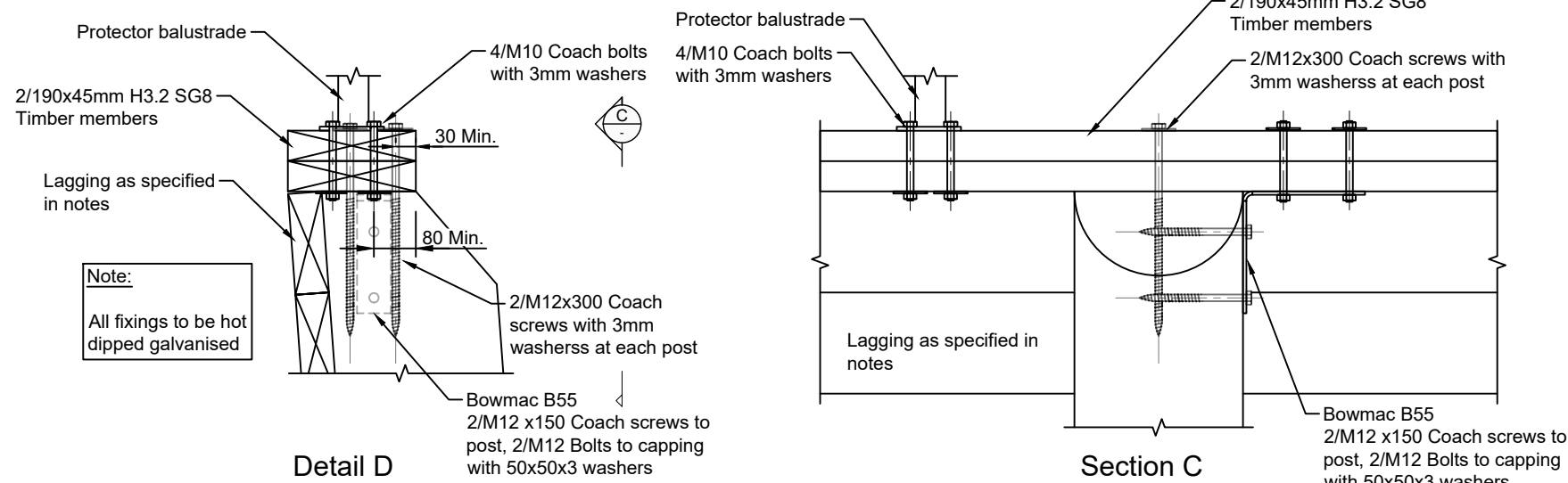
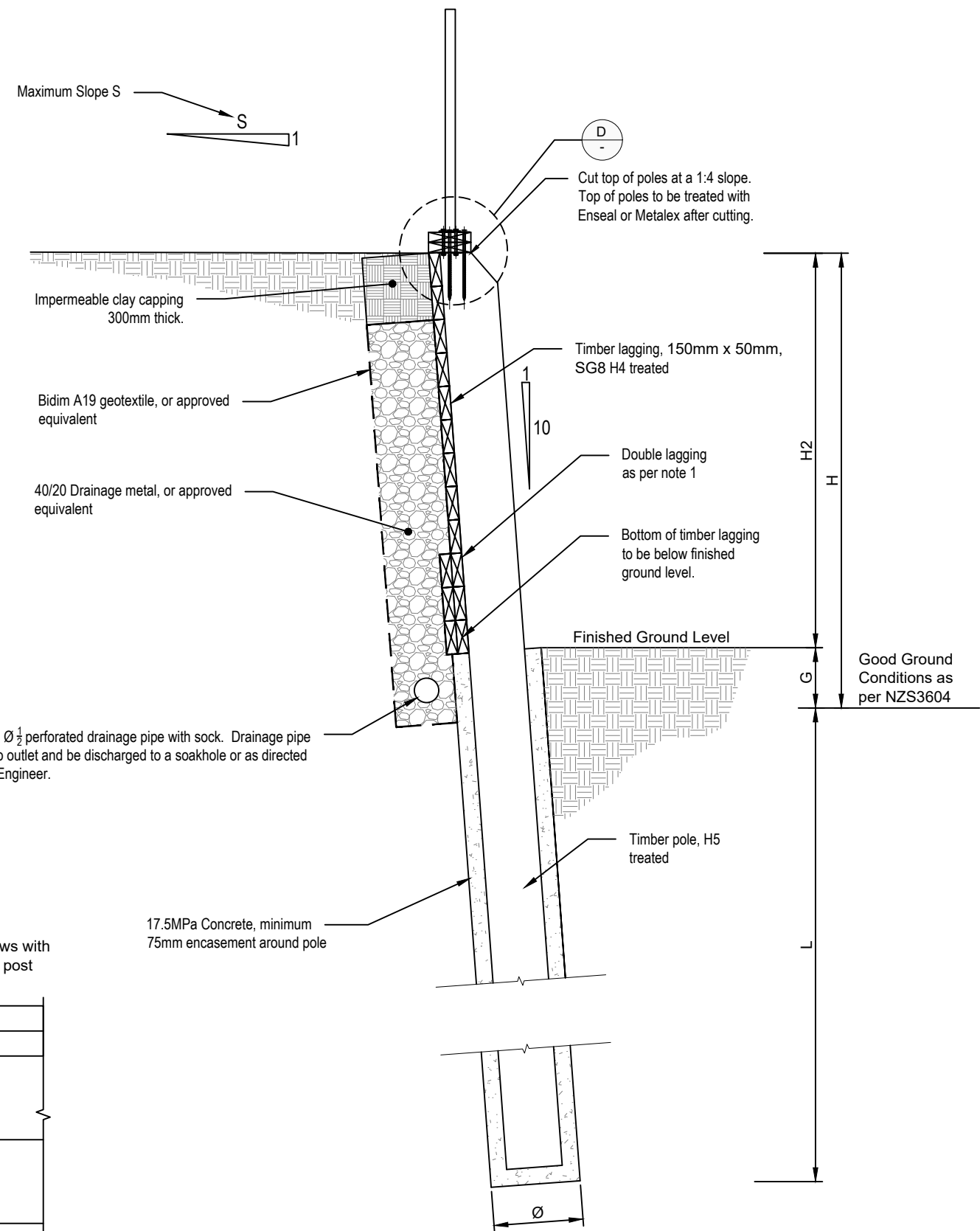
Sheet Title:
TYPICAL TIMBER RETAINING
WALL AT GARAGE SHEET 01

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | T02 | Sheet #: | 01 |

Notes:

1. Timber lagging to be 50mm thick from top of wall to 1.4m below top of retaining wall. Lower positioned timber lagging shall be 2 x 50mm boards thick from 1.4m below top of wall. All boards are to be No 1 Framing Grade.
2. All poles are normal density except for HD marked poles(if applicable) which are high density strength (tested for 52MPa)
3. Safety Rail/Fence 1.1m high to retained areas(H2) over 1.0m high as per NZBC F4 by others (proprietary product). Design heights over 1m high may not be applicable. Review architectural drawings.
4. All fixings to be SS304
5. *Estimate depth to good ground conditions as per NZS3604 based on the site's geotechnical report/testing. The Contractor must feed back photos to Engineer for review to verify depth of organics. If there is any deeper organics found on site contact the Engineer. The areas may be filled with granular fill in layers of 200mm thick, compacted and tested OR timber poles may need to be extended deeper.
6. Refer to architectural drawings for retaining heights and wall positions.
7. Engineering inspections are required for the embedment of poles to verify ground conditions prior to placing the poles into the hole and pouring concrete.

| TIMBER RETAINING WALL AT POOL | | | | | | |
|---|-------------|------|------|------|------|------|
| Timber Pole Retaining Wall Type (See Plan Drawings) | Wall Type 2 | | | | | |
| Retained Height H2 (mm) | 2300 | 2000 | 1700 | 1400 | 1100 | 800 |
| Pole diameter SED (mm) | 250 | 225 | 175 | 150 | 150 | 150 |
| Pole spacing SP (mm) | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 |
| *Estimated depth to "good ground" to be verified during construction G (mm) | 300 | 300 | 300 | 300 | 300 | 300 |
| Embedment Depth L (mm) | 2700 | 2400 | 2100 | 1800 | 1500 | 1200 |
| Maximum retained height H2+G=H (mm) | 2600 | 2300 | 2000 | 1700 | 1400 | 1100 |
| Total Pole Length H+L (mm) | 5300 | 4700 | 4100 | 3500 | 2900 | 2300 |
| Timber lagging thickness (mm) | *See Note 1 | | | 50 | 50 | 50 |
| Minimum concrete diameter if applicable (mm) | 450 | 450 | 450 | 450 | 450 | 350 |
| Minimum design front slope | N/A | N/A | N/A | N/A | N/A | N/A |
| Maximum design back slope S (ratio) | 1:10 | 1:10 | 1:10 | 1:10 | 1:10 | 1:10 |
| Design surcharge (kpa), Static Load | 5kpa | 5kpa | 5kpa | 5kpa | 5kpa | 5kpa |



BARRIED TO FALLING POST DETAIL

Scale 1:10

TYPICAL RTW AT POOL (SECTION B-B)

Scale 1:25

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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Project Title:
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SED

Sheet Title:
TYPICAL TIMBER RETAINING
WALL AT POOL SHEET 01

Job #:

24106

Scale (A3 Original):

As Shown

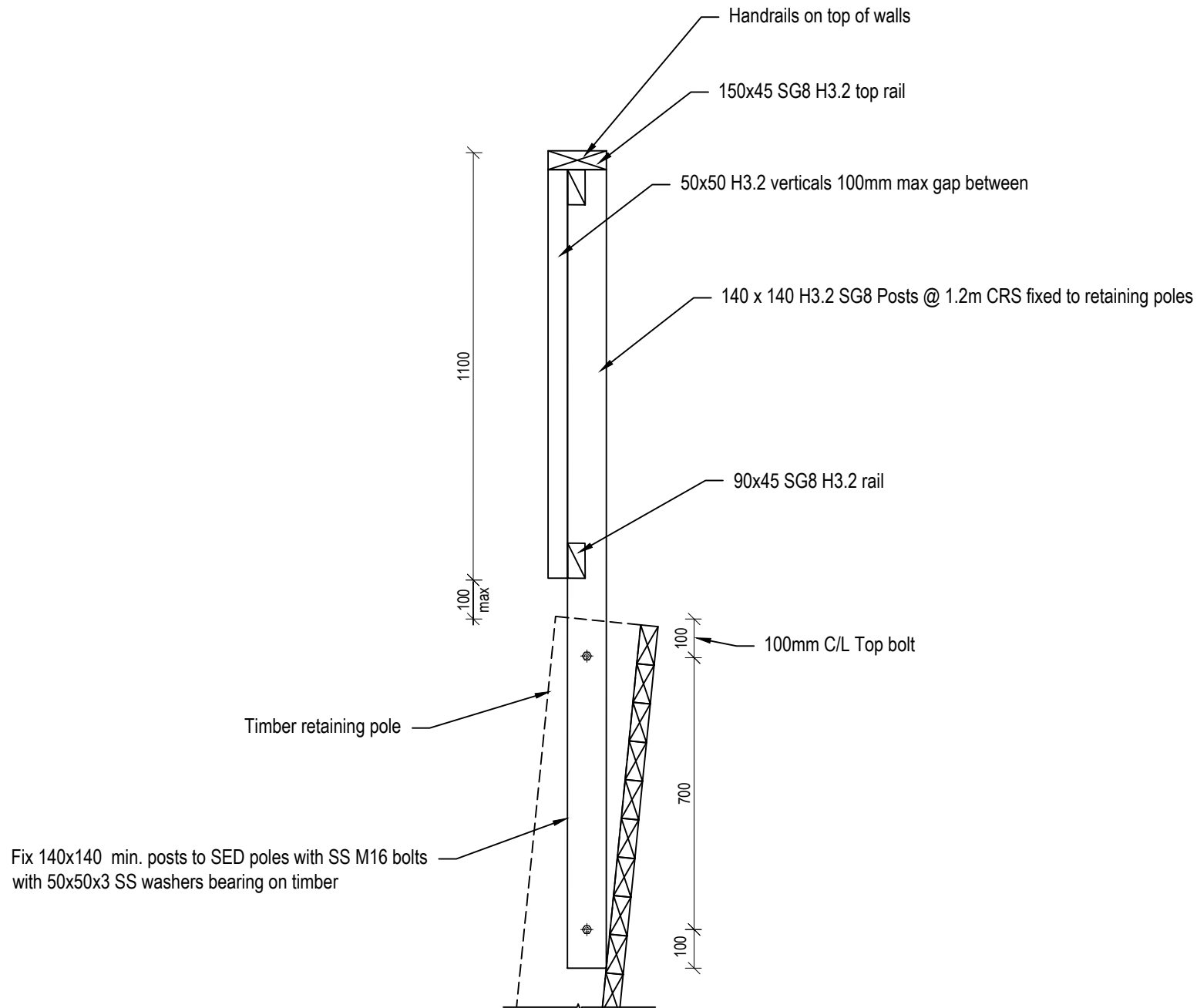
Client Drawing #:

T03

Sheet #:

01

Rev No:



NOTES:

- 50x50 verticals may be replaced with 50x100 members if the client/owner permits.
- Refer to architectural/landscape drawings for final position of balustrades.

FIXINGS:

- All fixings to be stainless steel.
- All rails to have a minimum of type T fixing as per NZS 3604, table 2.2 (1/10g self driving screw, 80mm long). Any proposed alternatives must have a minimum fixing capacity of 1KN in each direction.
- All verticals may be fixed with a nominal fixing as per NZS 3604 with a minimum fixing capacity of 0.5KN in each direction. Type T fixing or similar.

TIMBER:

- All timber to be minimum radiata pine grade VSG8
- All timber to receive a minimum of H3 preservative treatment unless noted otherwise.
- All cut surfaces to receive a liberal coating of metalex clear preservative.

APPLICABLE STANDARDS:

| | Standards | |
|--|-----------|------|
| Code of practice for specifying timber and wood-based products for use in building | NZS | 3602 |
| Timber structures standard | NZS | 3603 |
| Timber framed buildings | NZS | 3604 |
| Chemical preservation of round and sawn timber | NZS | 3640 |
| Timber piles and poles for use in buildings | NZS | 3605 |
| New Zealand timber grading rules | NZS | 3631 |
| ISO metric hexagon commercial bolts and screws | AS/NZS | 1111 |

01 TYPICAL BALUSTRADE DETAIL - 1M HEIGHT FALLS AND ABOVE
Scale 1:15

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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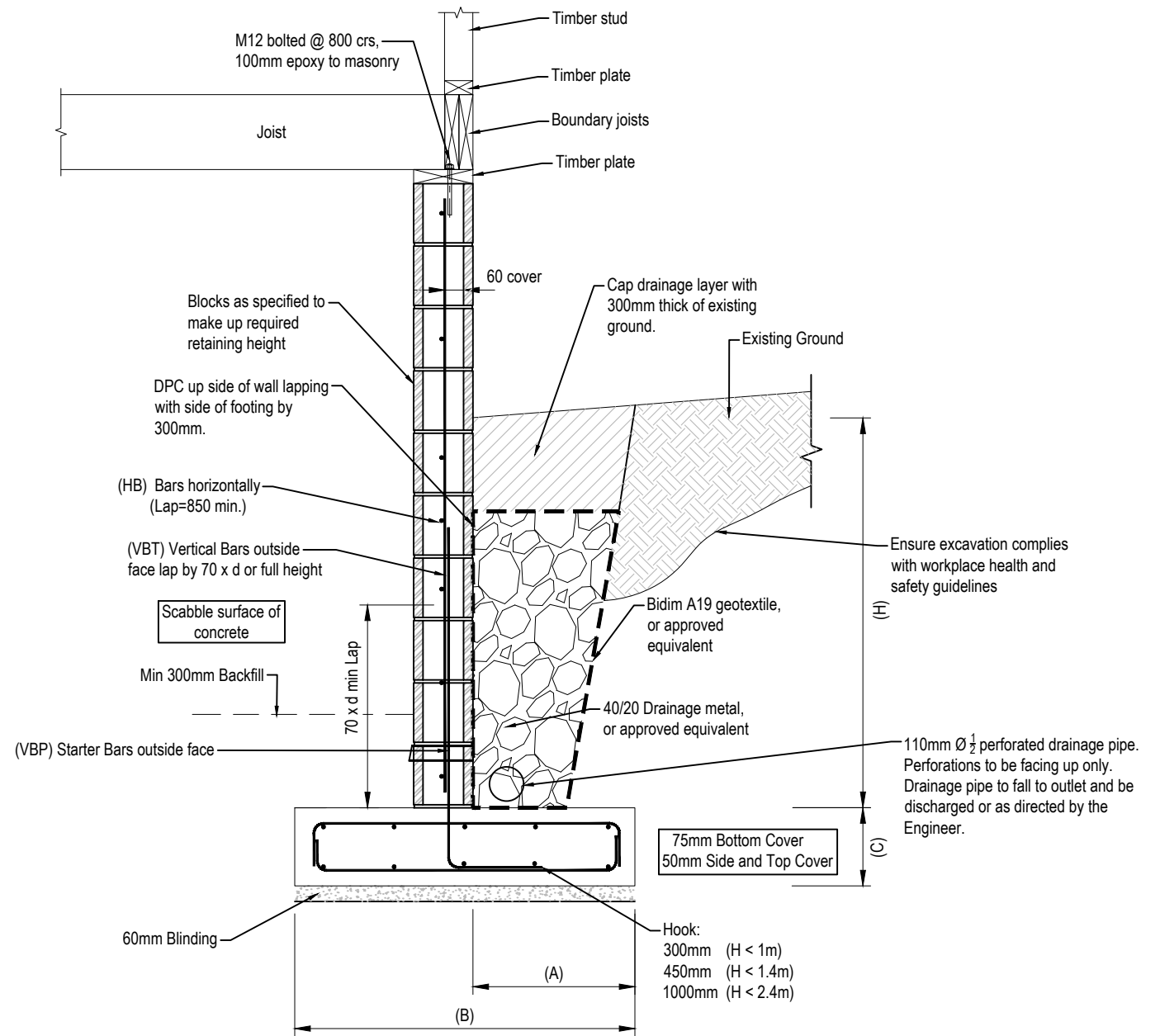
Sheet Title:
TYPICAL TIMBER
BALUSTRADE DETAIL

| | | | | |
|-------------------|----------|----------|----------------------|----------|
| Job #: | 24106 | | Scale (A3 Original): | As Shown |
| Client Drawing #: | Sheet #: | Rev No.: | | |
| | BL1 | 01 | | |

NOTES:

- Construction to be in accordance with NZS 4210.
- Concrete for foundation to be 20Mpa at 28 days.
- Reinforcement is deformed 500 E grade
- CJ = Suggested control joint in wall (marked in plan)
- d = Diameter of larger lapping bar
- Block wall and slab to cure 3 days prior to backfilling
- Refer to architectural drawings for further details. These drawings demonstrate engineering limitations and details.
- Drainage metal shall be a layer of suitable granular material with perforated pipe to discharge as required by the building consent authority.
- Waterproofing to be certified by the supplier and the installer.
- Cover: 75mm bottom, 50mm sides and top.
- Acceptable alternative to step detail: return walls to be attached to wall via 4xHD12 Chemset bars spaced vertically and evenly at step change. Epoxy embedded by 150mm. bars to be 1,0m long.
- Backfill to be approved by the Engineer and compacted in minimum layers of 200mm thick. All top soil and organics to be removed below footings.

| BLOCK WORK RETAINING WALL | | | |
|------------------------------------|-----------------------|-----------------------|-----------------------|
| DESCRIPTION | WALL TYPE 1 | WALL TYPE 2A, 2B, 2C | WALL TYPE 3 |
| Maximum Retained height (H) | 0.0m | 1.0m Max. | 2.0m Max. |
| Minimum Thickness of Wall | 20 Series Block | 20 Series Block | 20 Series Block |
| Minimum Heel Width (A) | 0.4m | 0.5m | 0.8m |
| Minimum Total Width of Footing (B) | 1.0m | 1.2m | 2.0m |
| Outside Toe Width | 0.6m | 0.7m | 1.2m |
| Minimum Thickness of Footing (C) | 0.3m | 0.3m | 0.3m |
| Minimum Depth of Shear Key (K) | No Shear Key Required | No Shear Key Required | No Shear Key Required |
| Maximum Backslope | 10° | 10° | 10° |
| Vertical Control joint Spacing | 7.0m Max. | 7.0m Max. | 7.0m Max. |
| Vertical Bars Top (VBT) | HD12 @ 600 C/C | HD12 @ 600 C/C | HD12 @ 200 C/C |
| Horizontal Bars (HB) | HD12 @ 400 C/C | HD12 @ 400 C/C | HD12 @ 400 C/C |
| Vertical Primary Bars (VPB) | HD12 @ 600 C/C | HD12 @ 600 C/C | HD12 @ 200 C/C |
| Footing Primary Steel Bars (PS) | HD12 @ 600 C/C | HD12 @ 600 C/C | HD12 @ 200 C/C |
| Footing Secondary Steel Bars (SS) | HD12 @ 400 C/C | HD12 @ 400 C/C | HD12 @ 300 C/C |



01 TYPICAL SECTION 01 BLOCKWORK RETAINING WALL
Scale 1:20

| | | | | |
|----------------|-----|------------------|-------------|---------------|
| Surveyed: LOSC | | | | |
| Designed: PW | | | | |
| Drawn: JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: PW | Rev | Revision Details | Approved by | Date |

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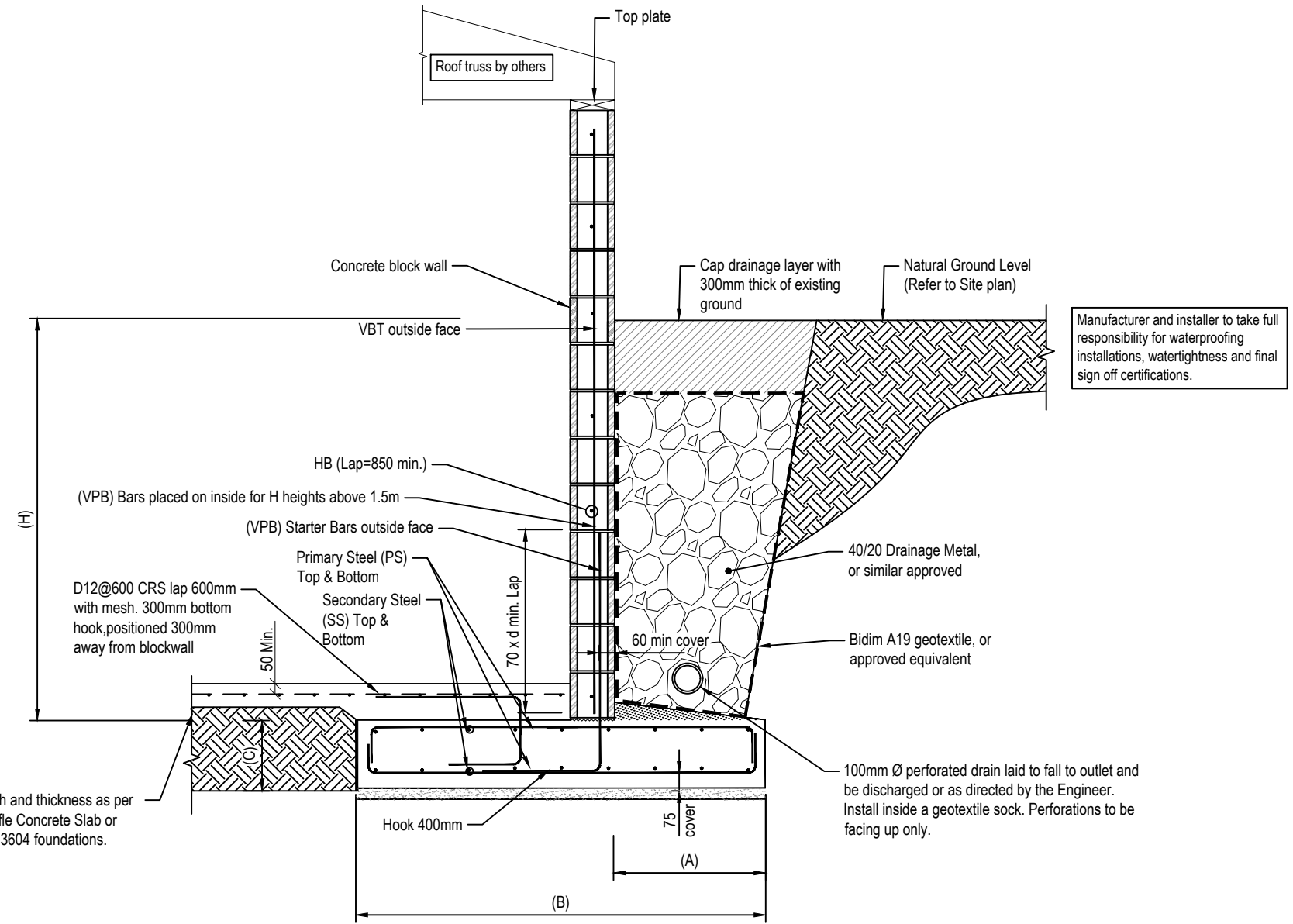
Sheet Title:
TYPICAL BLOCK RETAINING
WALL DETAILS SHEET 01

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | BR1 | Sheet #: | 01 |

Notes:

1. Construction to be in accordance with NZS 4210.
2. Concrete for foundation to be 25Mpa at 28 days.
3. Reinforcement is deformed 500 E grade
4. CJ = Suggested control joint in wall (marked in plan)
5. d = Diameter of larger lapping bar
6. Block wall and slab to cure five (5) days prior to backfilling
7. Refer to architectural drawings for further details with precise dimensions. These drawings demonstrate engineering limitations and details.
8. Drainage metal shall be a layer of suitable granular material with perforated pipe to discharge as required by the building consent authority.
9. Waterproofing to be certified by the supplier and the installer.
10. Cover: 75mm bottom, 50mm sides and top.
11. NZS3604 and Waffle Concrete Slab Foundations to be attached to wall via 2xHD12 Chemset bars at step change, epoxy embedded by 130mm. Bars to be 1,0m long.
12. Backfill to be approved by the Engineer and compacted in minimum layers of 200mm thick.
13. Subsoil may be placed directly behind the wall as an alternative on approval from the waterproofing supplier and installer. Subsoil to drain on each end to drainage point. Subsoil may penetrate the return block walls if required.

| BLOCK WORK RETAINING WALL | | | | |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| DESCRIPTION | WALL TYPE 7 | WALL TYPE 4 | WALL TYPE 5 | WALL TYPE 6 |
| Maximum Retained height (H) | 0.5m Max | 1.5m Max. | 2.0m Max | 2.5m Max |
| Minimum Thickness of Wall | 20 Series Block | 20 Series Block | 20 Series Block | 25 Series Block |
| Minimum Heel Width (A) | 0.0m | 0.6m | 0.8m | 1.0m |
| Minimum Total Width of Footing (B) | 0.8m | 1.5m | 2.0m | 2.4m |
| Outside Toe width | 0.8m | 0.9m | 1.2m | 1.4m |
| Minimum Thickness of Footing (C) | 0.3m | 0.3m | 0.3m | 0.3m |
| Minimum Depth of Shear Key (K) | No Shear Key required | No Shear Key required | No Shear Key required | No Shear Key required |
| Maximum Backslope | 20° | 20° | 20° | 20° |
| Vertical Control joint Spacing | 7.0m Max. | 7.0m Max. | 7.0m Max. | 7.0m Max. |
| Vertical Bars Top (VBT) | HD12 @ 400 C/C | HD12 @ 200 C/C | HD16 @ 200 C/C | HD16 @ 400 C/C |
| Horizontal Bars (HB) | HD12 @ 400 C/C | HD12 @ 400 C/C | HD12 @ 400 C/C | HD12 @ 400 C/C |
| Vertical Primary Bars (VPB) | HD12 @ 400 C/C | HD12 @ 400 C/C | HD16 @ 200 C/C | HD16 @ 400 C/C |
| Footing Primary Steel Bars (PS) | HD12 @ 200 C/C | HD12 @ 200 C/C | HD12 @ 200 C/C | HD12 @ 200 C/C |
| Footing Secondary Steel Bars (SS) | HD12 @ 300 C/C | HD12 @ 300 C/C | HD12 @ 300 c/c | HD12 @ 300 c/c |



**TYPICAL SECTION : SRW
STEP INTEGRAL BLOCK WORK RETAINING WALL**

Scale: 1:25

| | | | | |
|----------------|-----|-----------------------|-------------|---------------|
| Surveyed: LOSC | | | | |
| Designed: PW | 02 | FOR CONSENT - REVISED | PW | FEBRUARY 2025 |
| Drawn: JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: PW | Rev | Revision Details | Approved by | Date |

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Client:
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Project Title:
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KONINI ROAD, AUCKLAND -
SED

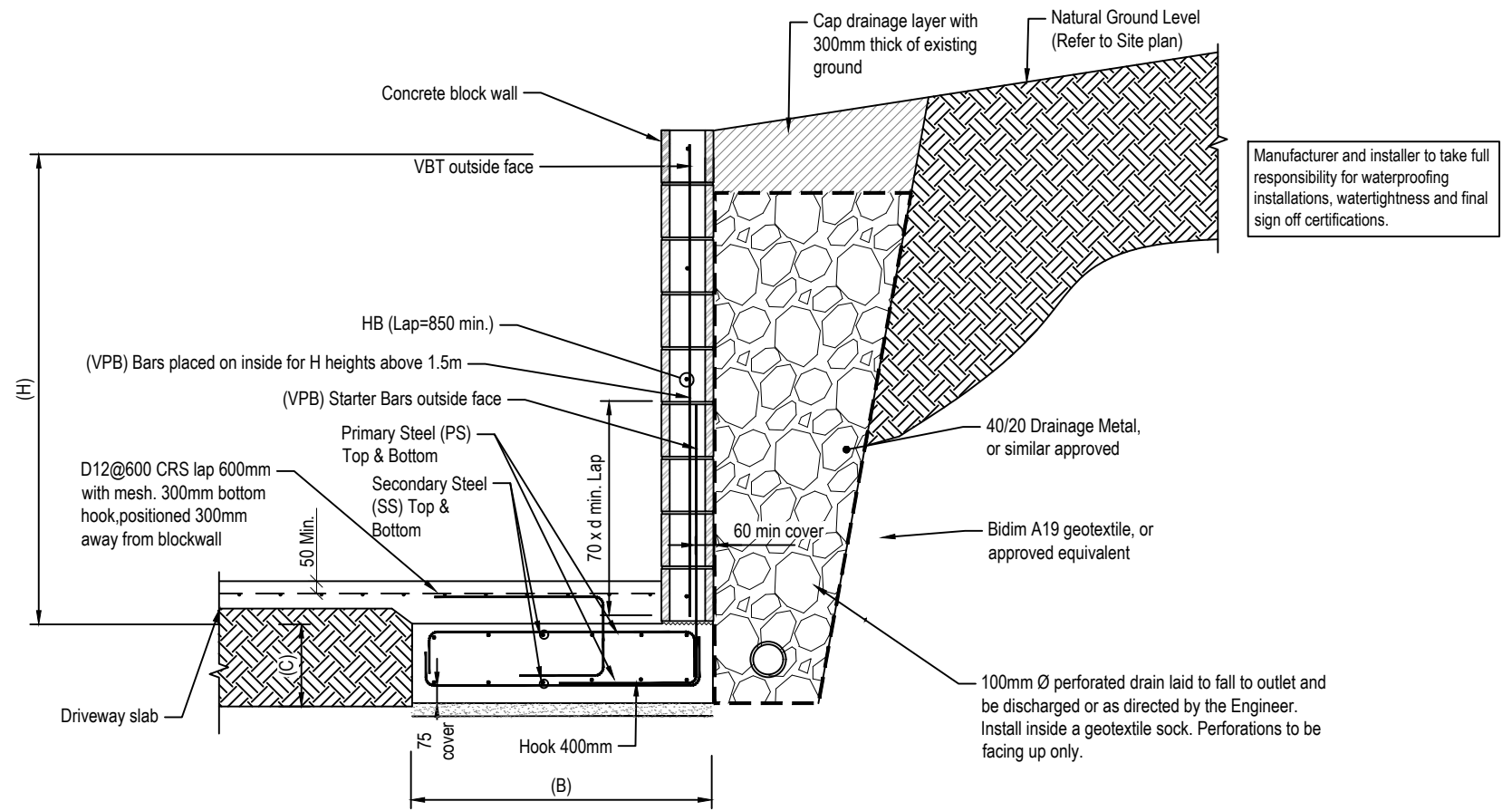
Sheet Title:
TYPICAL BLOCK RETAINING
WALL DETAILS SHEET 02

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | BR2 | Sheet #: | 02 |

Notes:

1. Construction to be in accordance with NZS 4210.
2. Concrete for foundation to be 25Mpa at 28 days.
3. Reinforcement is deformed 500 E grade
4. CJ = Suggested control joint in wall (marked in plan)
5. d = Diameter of larger lapping bar
6. Block wall and slab to cure five (5) days prior to backfilling
7. Refer to architectural drawings for further details with precise dimensions. These drawings demonstrate engineering limitations and details.
8. Drainage metal shall be a layer of suitable granular material with perforated pipe to discharge as required by the building consent authority.
9. Waterproofing to be certified by the supplier and the installer.
10. Cover: 75mm bottom, 50mm sides and top.
11. NZS3604 and Waffle Concrete Slab Foundations to be attached to wall via 2xHD12 Chemset bars at step change, epoxy embedded by 130mm. Bars to be 1,0m long.
12. Backfill to be approved by the Engineer and compacted in minimum layers of 200mm thick.
13. Subsoil may be placed directly behind the wall as an alternative on approval from the waterproofing supplier and installer. Subsoil to drain on each end to drainage point. Subsoil may penetrate the return block walls if required.

| BLOCK WORK RETAINING WALL | |
|------------------------------------|-----------------------|
| DESCRIPTION | WALL TYPE 8 |
| Maximum Retained height (H) | 1.5m Max |
| Minimum Thickness of Wall | 20 Series Block |
| Minimum Heel Width (A) | N/A |
| Minimum Total Width of Footing (B) | 2.0m |
| Outside Toe width | 2.0m |
| Minimum Thickness of Footing (C) | 0.3m |
| Minimum Depth of Shear Key (K) | No Shear Key required |
| Maximum Backslope | 20° |
| Vertical Control joint Spacing | 7.0m Max. |
| Vertical Bars Top (VBT) | HD20 @ 200 C/C |
| Horizontal Bars (HB) | HD12 @ 400 C/C |
| Vertical Primary Bars (VPB) | HD12 @ 200 C/C |
| Footing Primary Steel Bars (PS) | HD20 @ 200 C/C |
| Footing Secondary Steel Bars (SS) | HD12 @ 300 C/C |



**SECTION 3: SRW
STEP INTEGRAL BLOCK WORK RETAINING WALL**

Scale: 1:25

| | | | | |
|----------------|-----|-----------------------|-------------|---------------|
| Surveyed: LOSC | | | | |
| Designed: PW | 02 | FOR CONSENT - REVISED | PW | FEBRAURY 2025 |
| Drawn: JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: PW | Rev | Revision Details | Approved by | Date |

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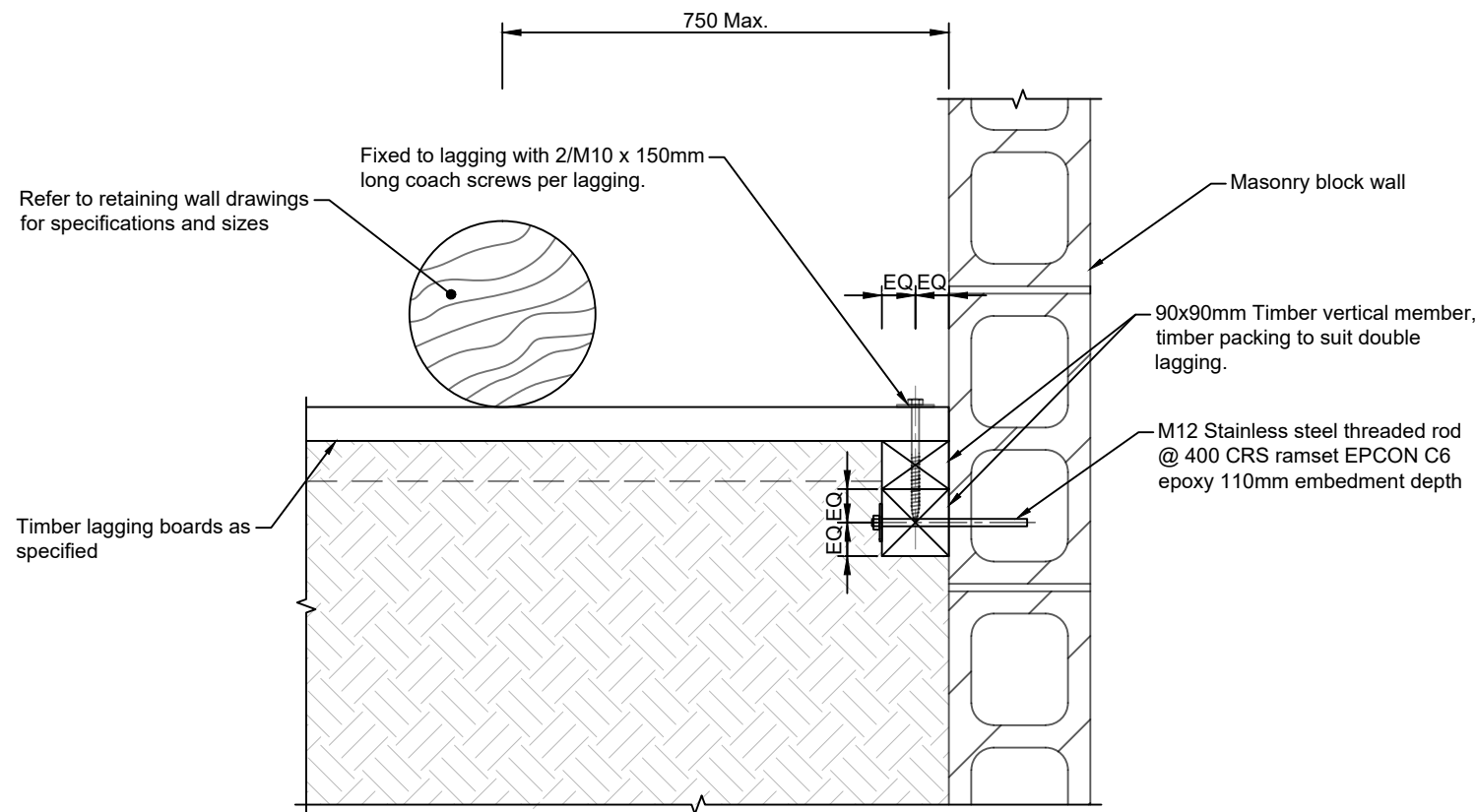
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Sheet Title:
TYPICAL BLOCK RETAINING
WALL DETAILS SHEET 02

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | BR3 | Sheet #: | 02 |



LAGGING TO MASONRY BLOCK WALL FIXING

Scale 1:10

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |

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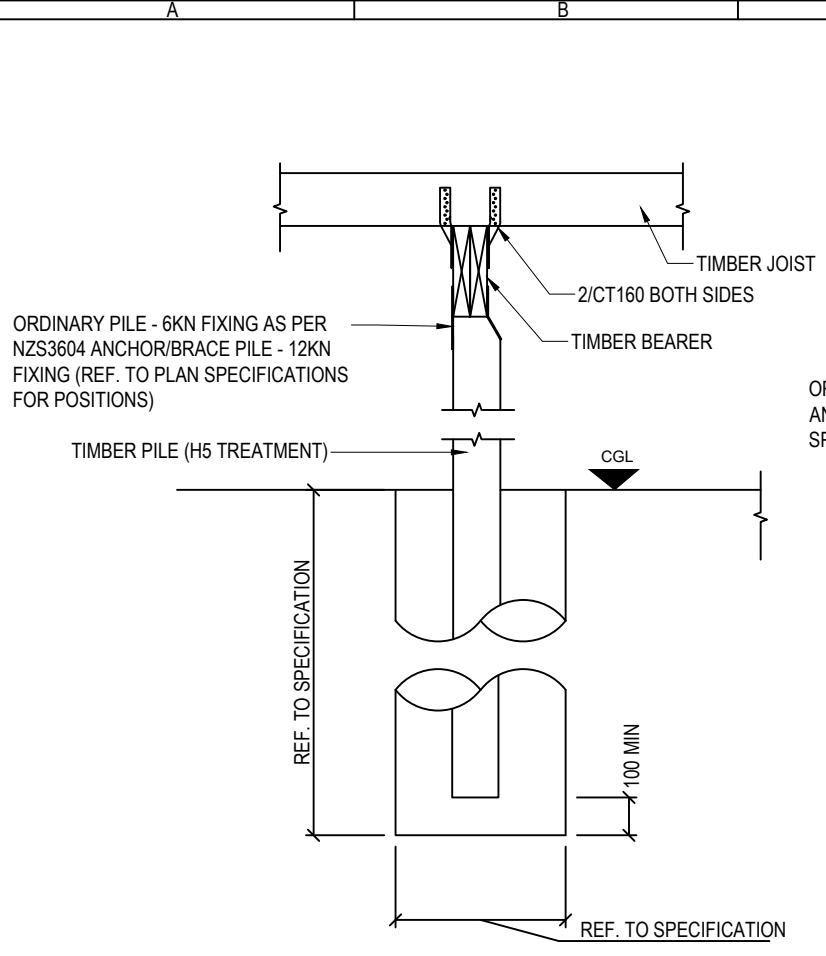
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TYPICAL BLOCK RETAINING
WALL DETAILS SHEET 03

Job #:
24106

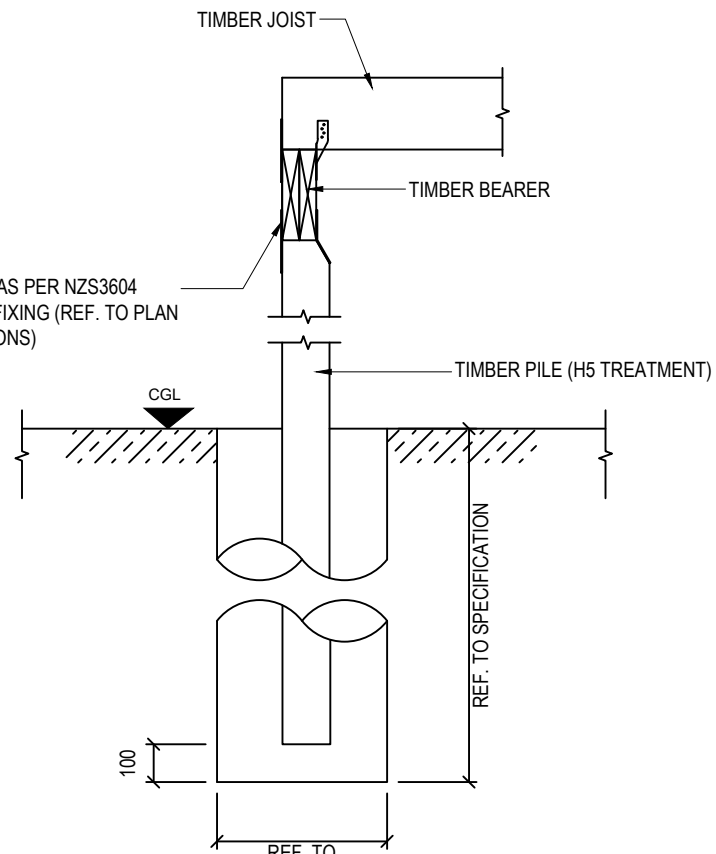
Client Drawing #:
BR3

Scale (A3 Original):
As Shown

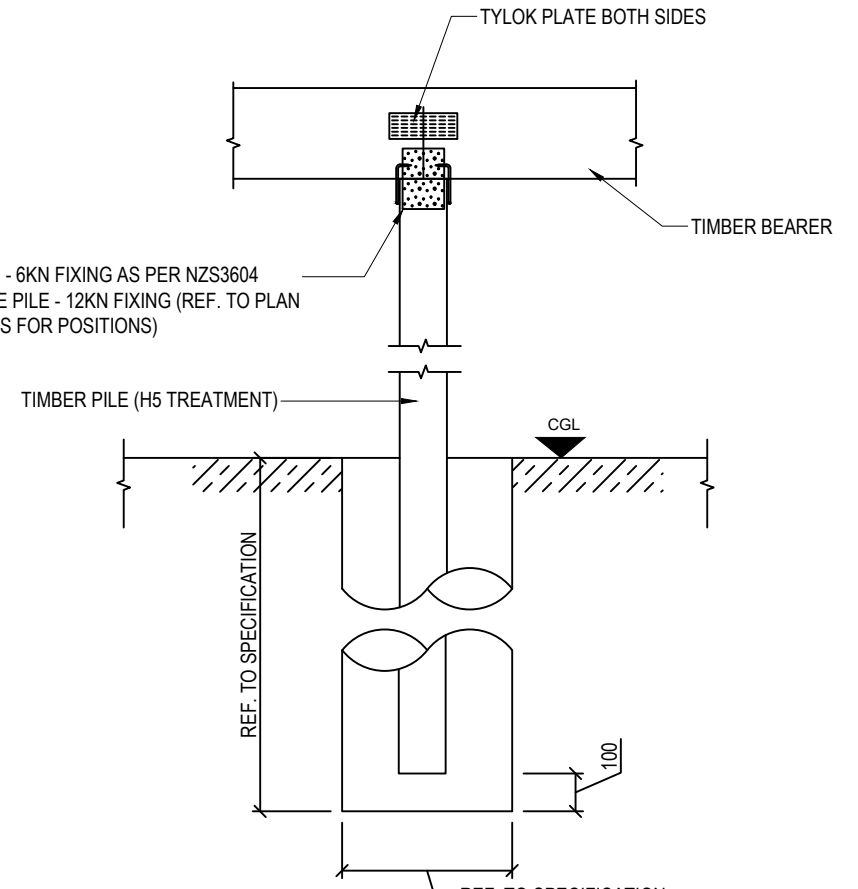
Sheet #:
01



01 - **JOIST TO PILE FIXING**
Scale 1:20



02 - **JOIST TO PILE JOIST EDGE FIXING**
Scale 1:20



03 - **BEARER SPLICE DETAIL**
Scale 1:20

| SPECIFIC PROJECT SUBFLOOR FOUNDATION REFERENCE TABLE | |
|--|-----------------------|
| DEPTH REQUIREMENT FROM GOOD GROUND LEVEL - ANCHOR & BRACE PILES (mm) | 900 |
| DEPTH REQUIREMENT FROM GOOD GROUND LEVEL - ORDINARY PILES (mm) | 600 |
| CONCRETE PILE DIAMETER (mm) | 450 |
| TIMBER PILE SIZE (mm) - REF. TO NZS 3604 Fig 6.2 | 125x125 SG8 |
| ANCHOR PILE REFERENCE | DETAIL 1, 2, 3, 5 & 6 |
| ORDINARY PILE REFERENCE | DETAIL 1,2,3 |
| BRACED PILE REFERENCE | DETAIL 1,2,3,5 & 7 |

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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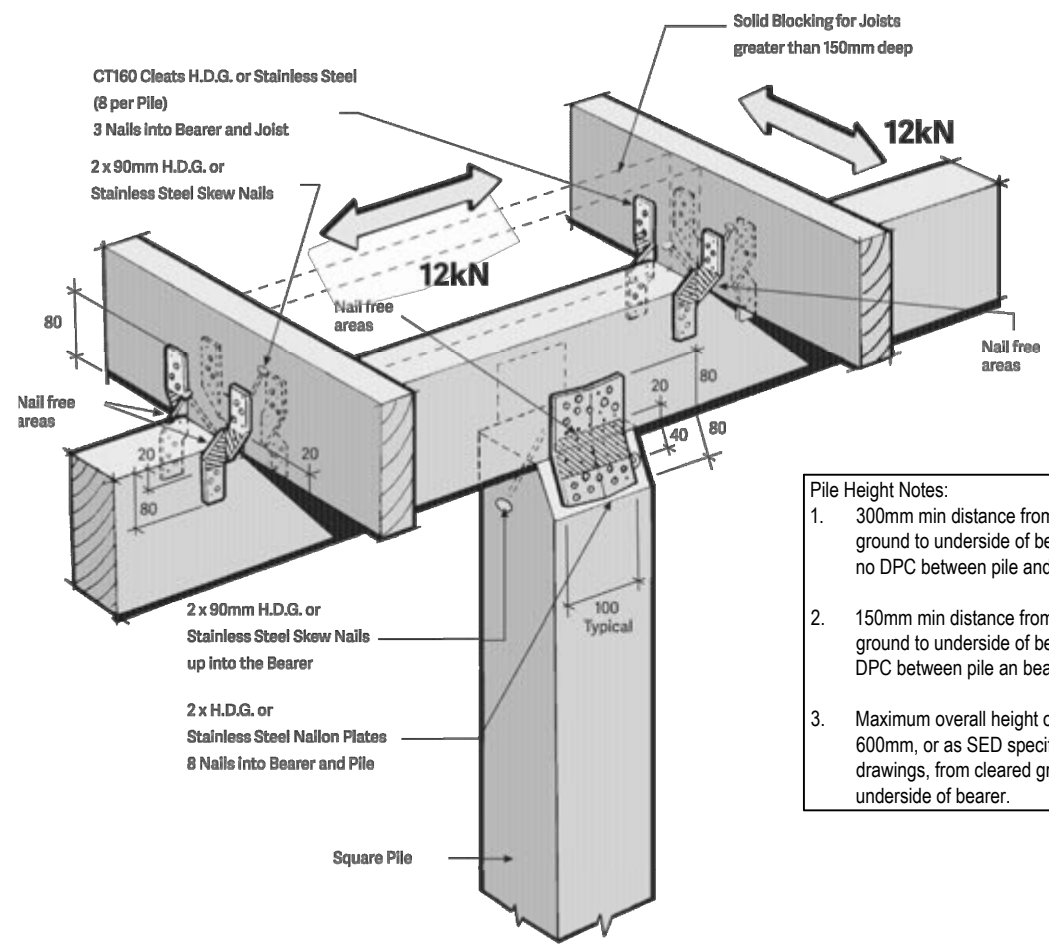
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Project Title:
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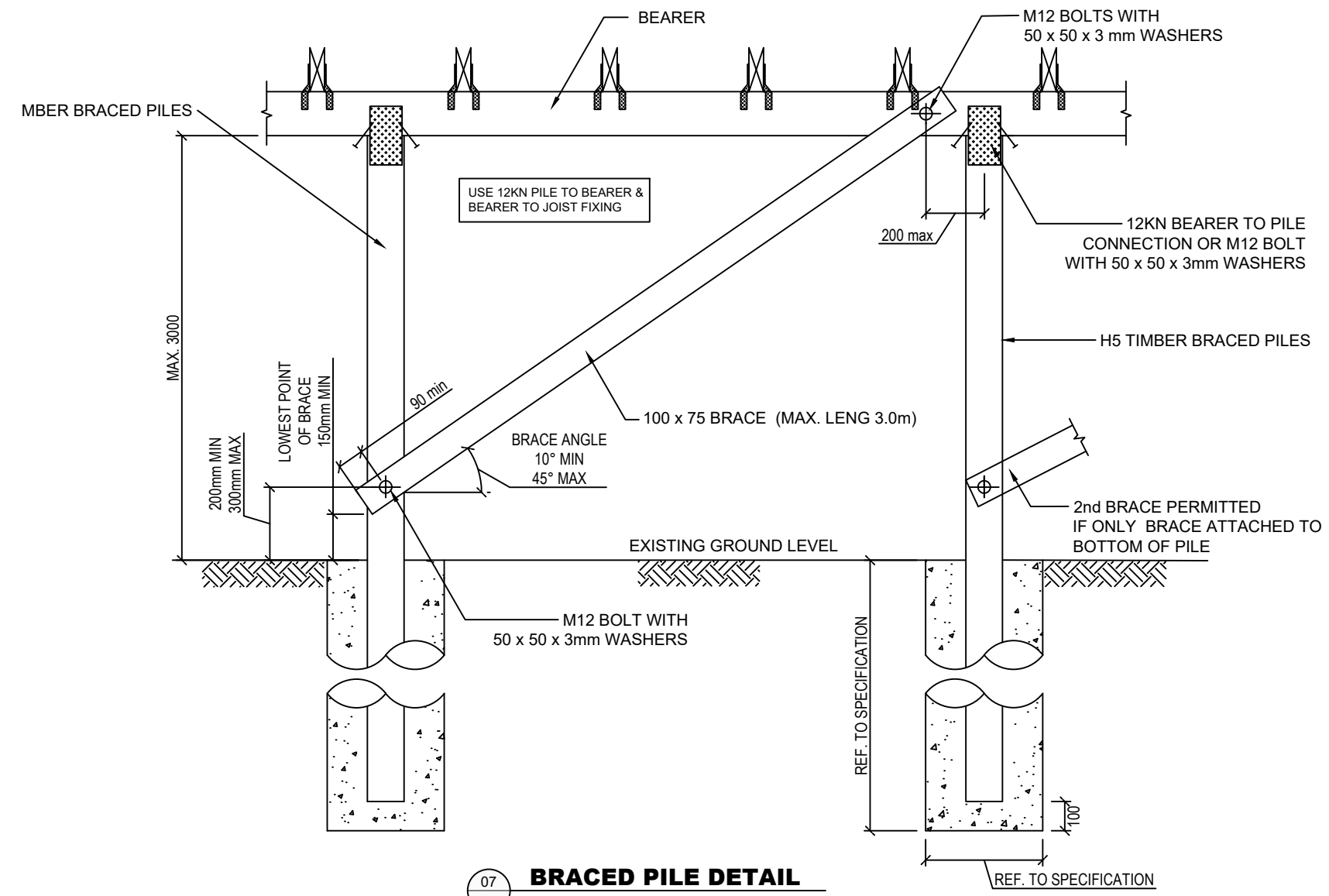
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SUBFLOOR ANCHOR PILE AND
ORDINARY PILE DETAILS

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | TP1 | Sheet #: | 01 |

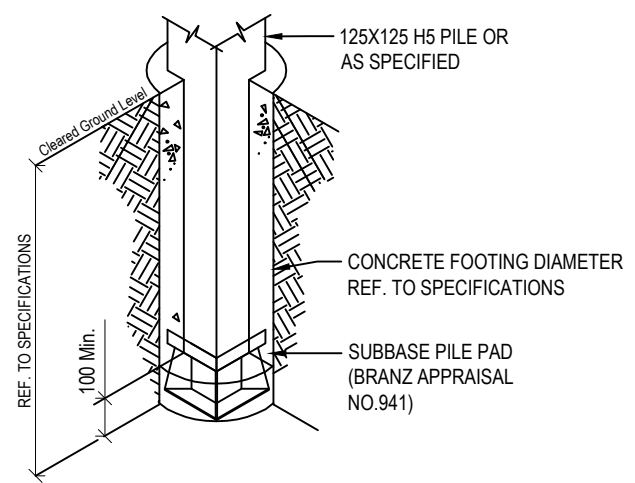


- Pile Height Notes:**
- 300mm min distance from cleared ground to underside of bearer with no DPC between pile and bearer.
 - 150mm min distance from cleared ground to underside of bearer with DPC between pile and bearer.
 - Maximum overall height of pile is 600mm, or as SED specified on drawings, from cleared ground to underside of bearer.

05 PILE TO BEARER & JOIST CONNECTION
Scale 1:20



07 BRACED PILE DETAIL
Scale 1:20



06 TYPICAL PILE
Scale 1:20

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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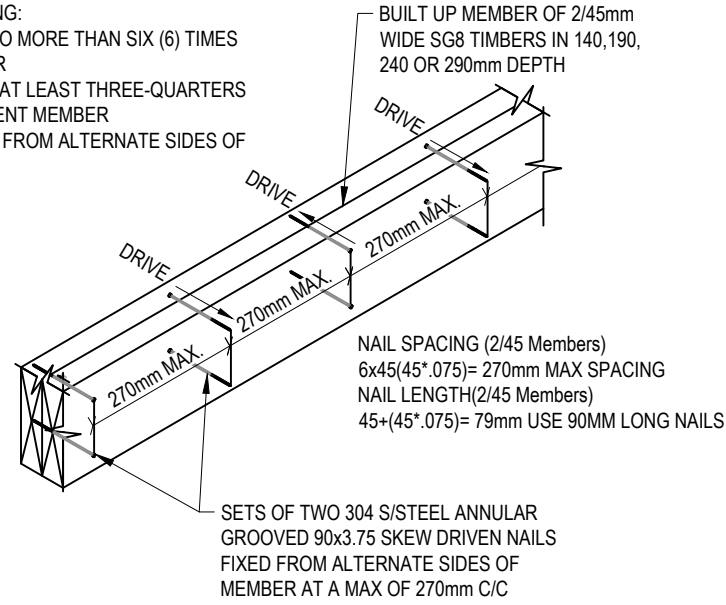


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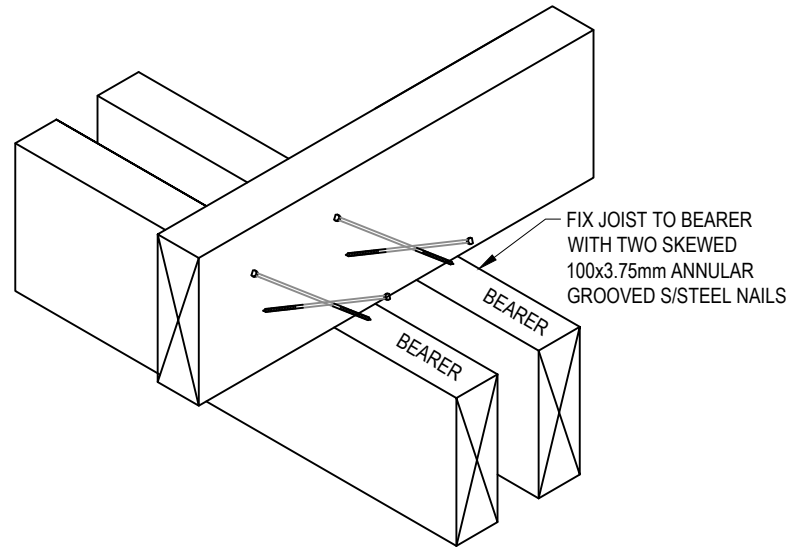
Sheet Title:
BRACED PILE DETAIL

| | | | |
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| Client Drawing #: | TP2 | Sheet #: | 01 |

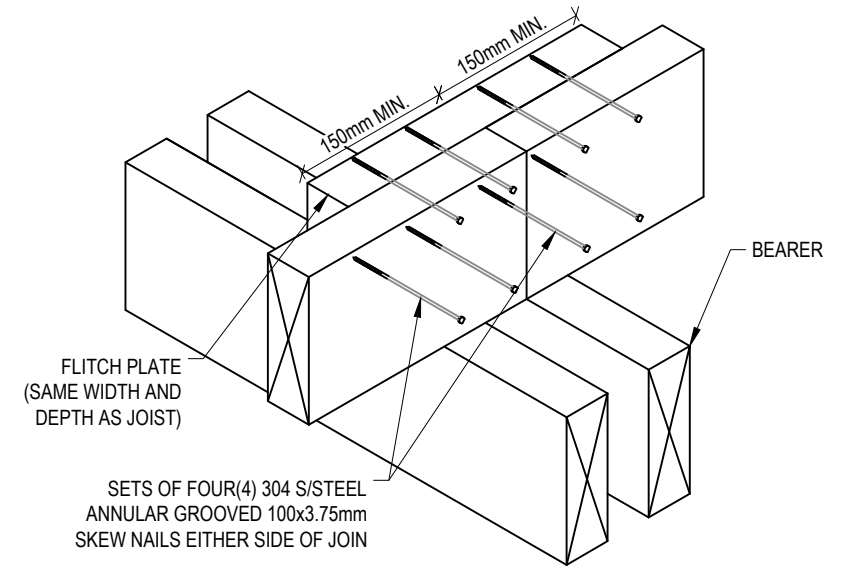
BUILT-UP MEMBER NAILING:
 - SPACING OF NAILS IS NO MORE THAN SIX (6) TIMES THE THINNEST MEMBER
 - ALL NAILS PENETRATE AT LEAST THREE-QUARTERS OF THE LAST COMPONENT MEMBER
 - NAIL SETS ARE DRIVEN FROM ALTERNATE SIDES OF BUILT-UP MEMBER



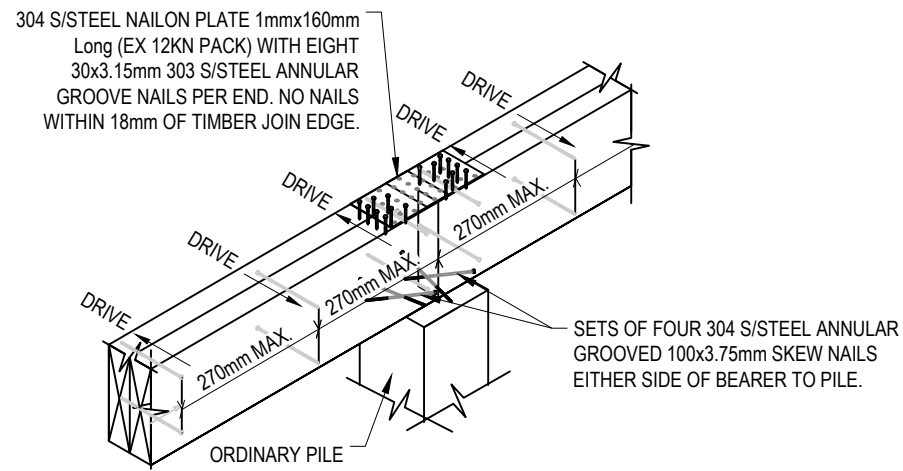
01 BUILT-UP 2/45mm BEARER
 Scale 1:10



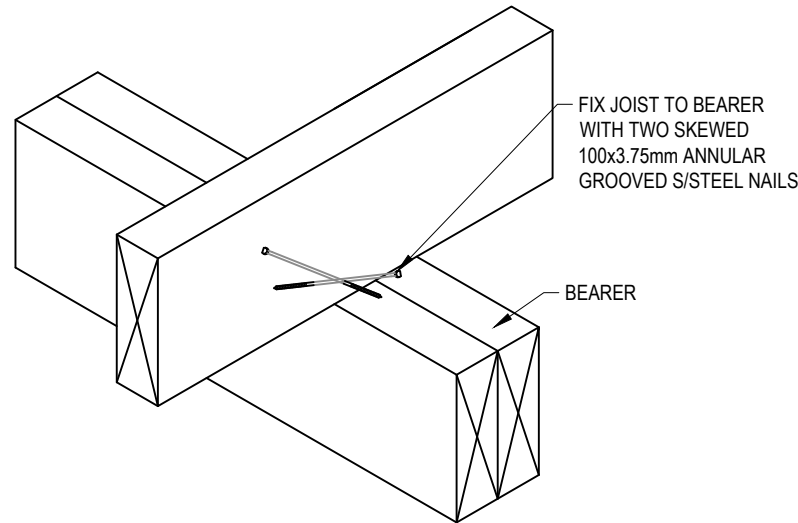
02 JOINING OF JOISTS AT BEARER
 Scale 1:10



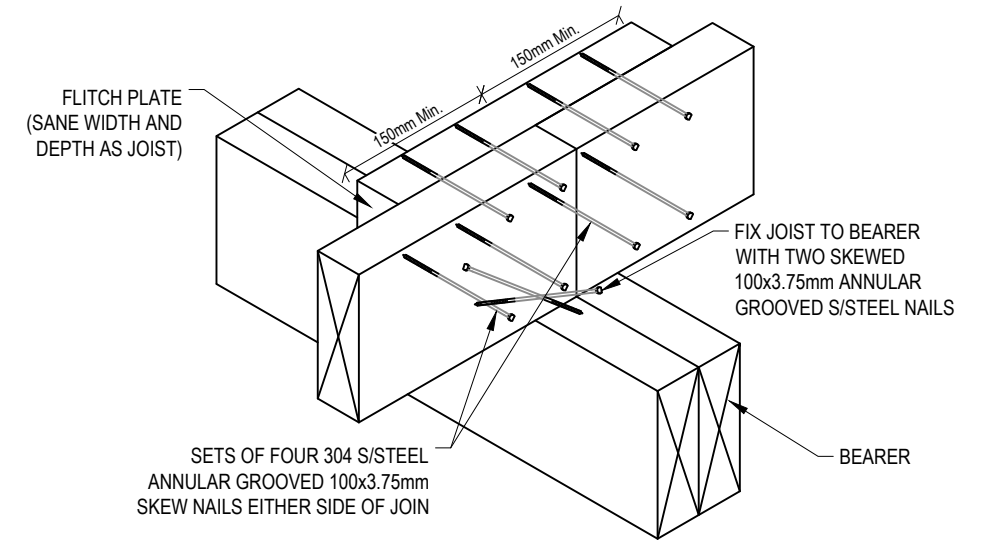
03 JOINING OF JOSITS AT BEARER
 Scale 1:10



04 JOINING OF BUILT-UP BEARER OVER ORDINARY PILE
 Scale 1:10



05 STANDARD JOIST TO BEARER CONNECTION
 Scale 1:10



06 JOINING OF JOISTS AT BEARER
 Scale 1:10

| | | | | | |
|--|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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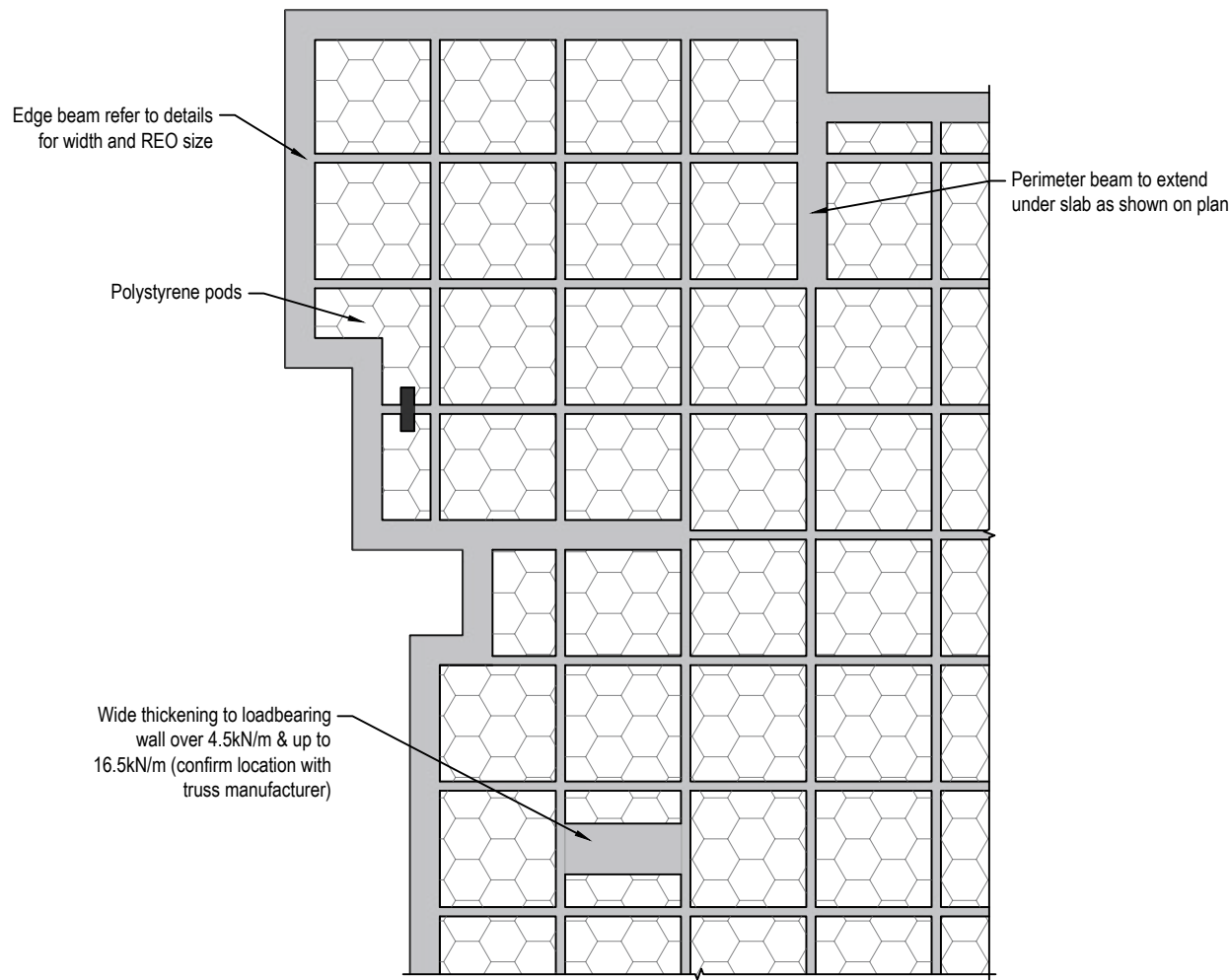
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Sheet Title:
 TIMBER BEARER AND JOIST
 CONNECTION DETAILS

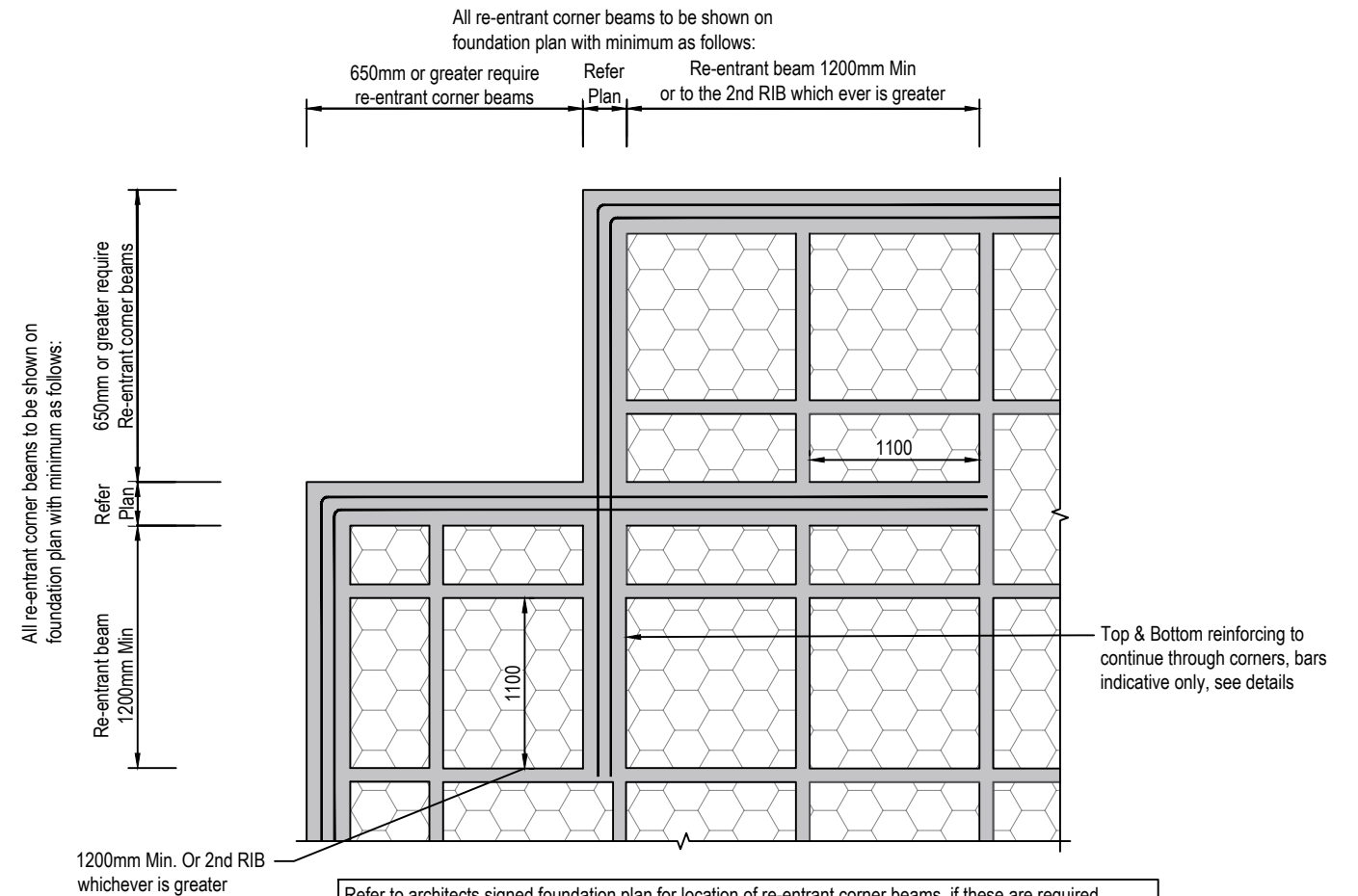
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| Client Drawing #: | TBJ | Sheet #: | 01 |
| Rev No.: | | | |



Note:
These details illustrate typical configurations only and must be read with the architectural drawings to assess the applications of details. refer to architectural foundation layout for specific geometry and configurations.

P1 **TYPICAL TC1 WAFFLE SLAB FOUNDATION - PLAN**
Scale 1:75

Note: These details illustrate typical configurations only and must be read with the architectural drawings to assess the applications of details. refer to architectural foundation layout for specific geometry and configurations.



Refer to architects signed foundation plan for location of re-entrant corner beams, if these are required
Refer specific details for steel re-inforcing in edge beams, re-entrant corners, slab thickening and ribs
If slab thickening under bearing wall is required in place of re-entrant beam, slab thickening reinforcing details (if different to edge beam reinforcing) is to be used and lapped back into edge beam, lap HD12 900mm Min.

P2 **TYPICAL TC1 RE-ENTRANT CORNER STEEL LAYOUT**
Scale 1:50

| | | | | | |
|--|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
| Checked: | PW | Rev | Revision Details | Approved by | Date |
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Sheet Title:
WAFFLE SLAB FOUNDATION
DETAILS SHEET 01

Job #:

24106

Scale (A3 Original):

As Shown

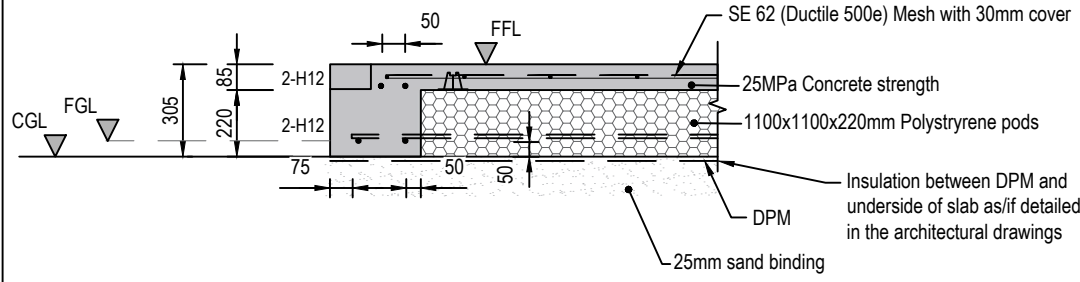
Client Drawing #:

Sheet #:

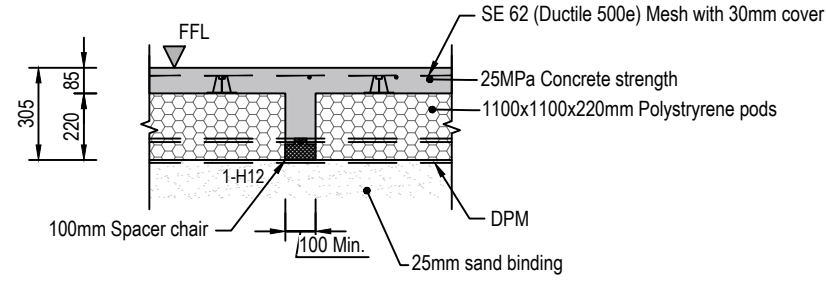
Rev No:

FT01 01

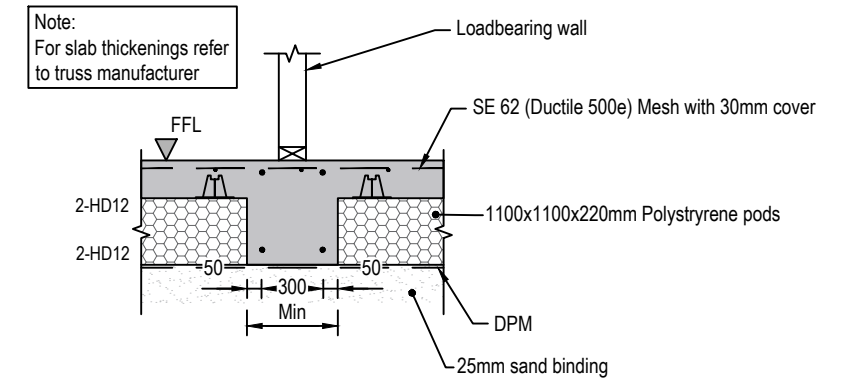
KEY:
 FFL : Finished floor level
 FGL: Finished ground level
 CGL: Cleared ground level
 DPM: Damp proof membrane



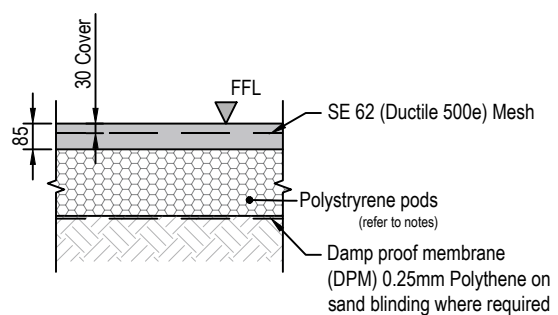
A1 TYPICAL EDGE BEAM
 Scale 1:25



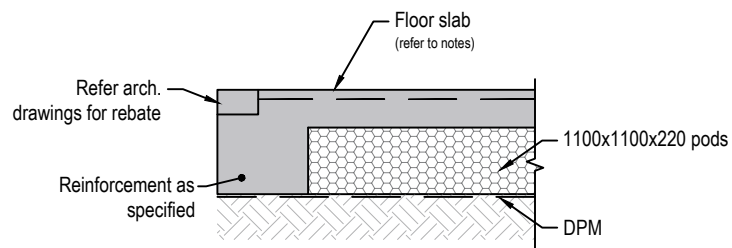
A2 TYPICAL RIB DETAIL
 Scale 1:25



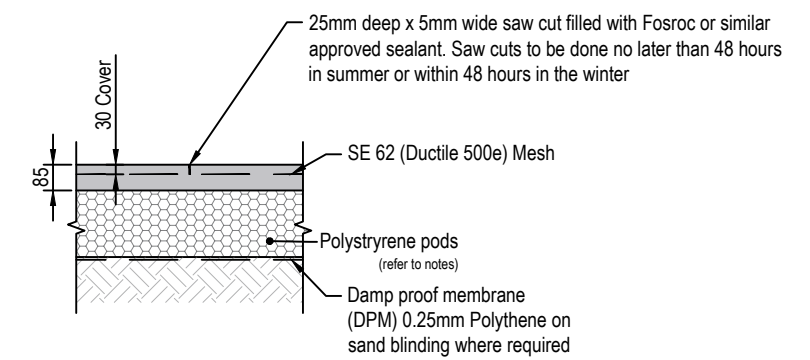
A3 TYPICAL SLAB THICKENING OR INTERNAL BEAM
 Scale 1:25



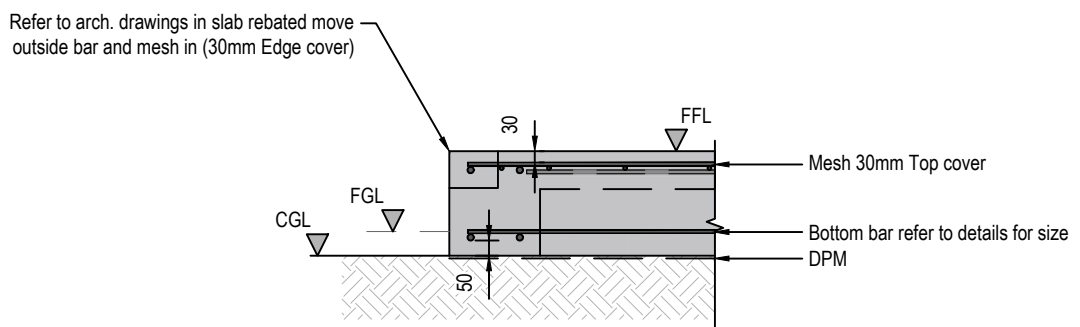
B1 SLAB THICKNESS & MESH
 Scale 1:25



B2 DETAIL SHOWING POD SIZES
 Scale 1:25



B3 TYPICAL SAWCUT JOINT
 Scale 1:25



C1 TYPICAL TOP BAR SECTION
 Scale 1:25

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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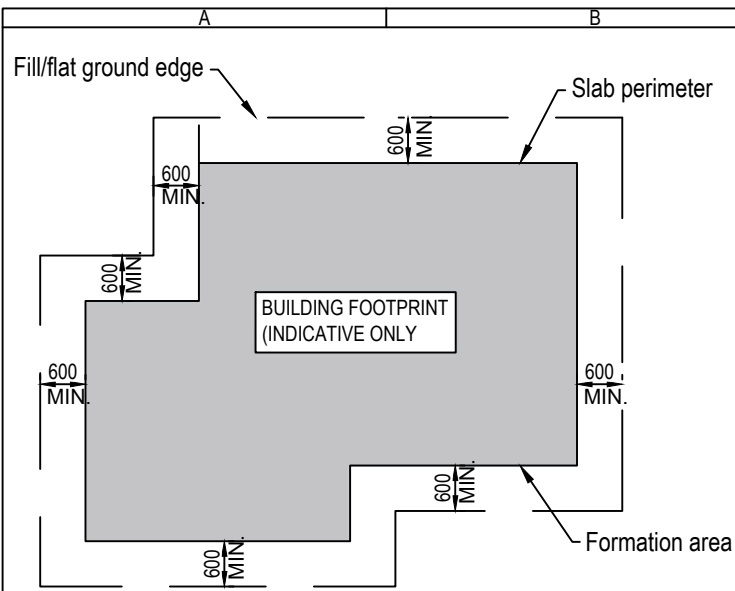
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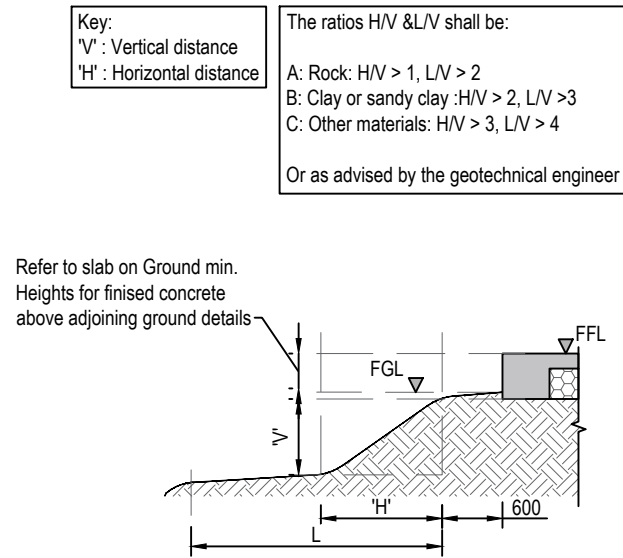
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Sheet Title:
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 DETAILS SHEET 02

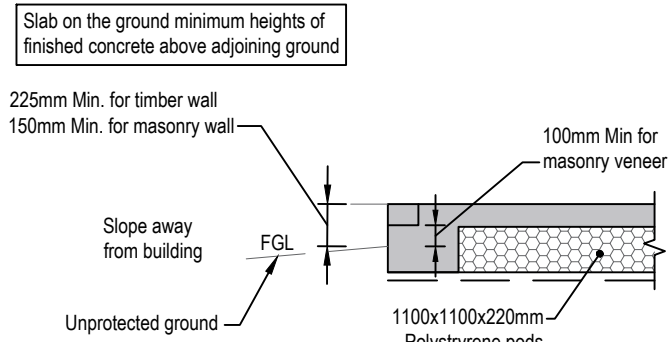
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| | | Rev No.: | 01 |



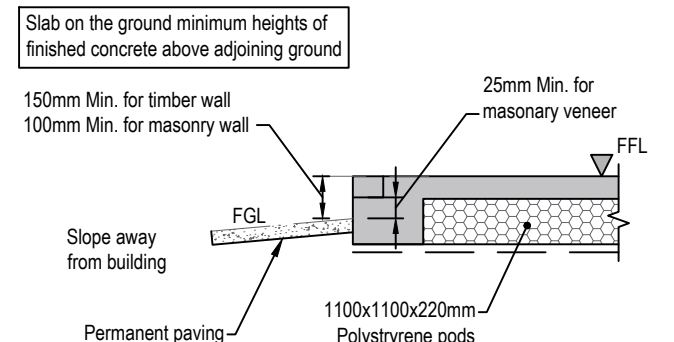
A1 TYPICAL FORMATION AREA
Scale 1:100



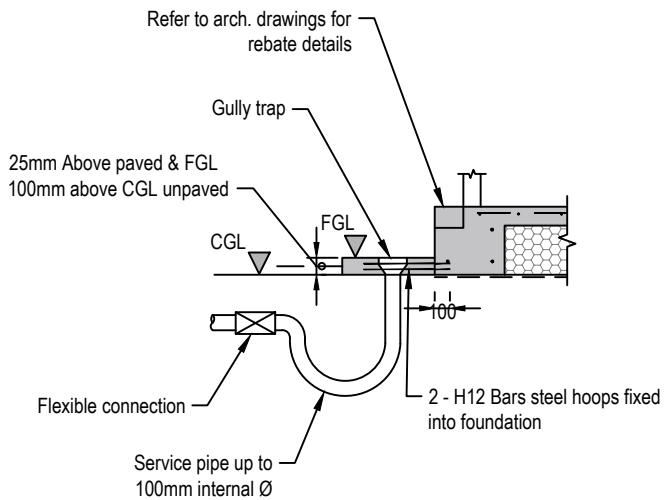
A2 TYPICAL SLOPING GROUND
Scale 1:75



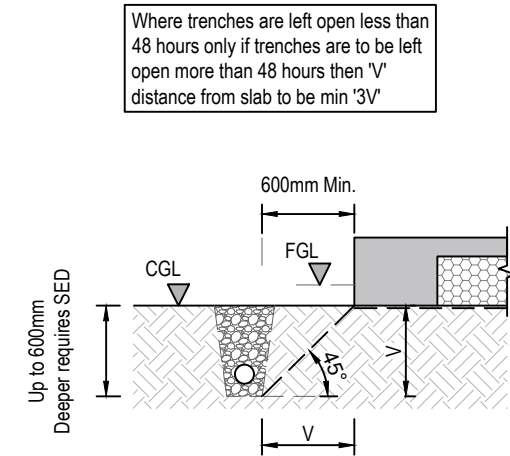
A3 TYPICAL NON PAVED AREAS
Scale 1:50



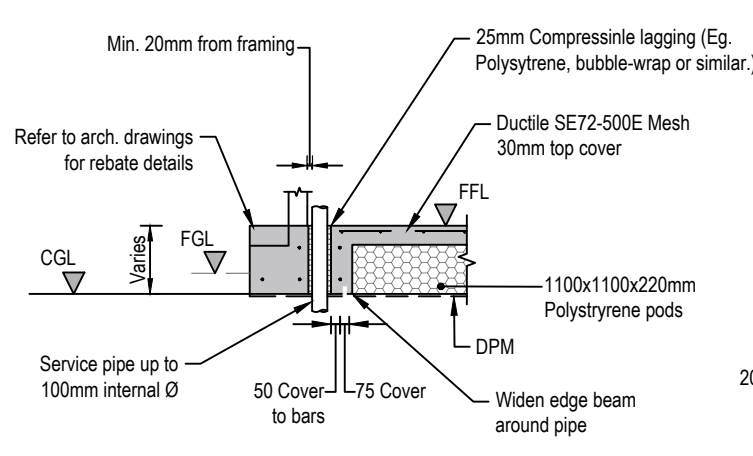
A4 TYPICAL PAVED AREAS
Scale 1:50



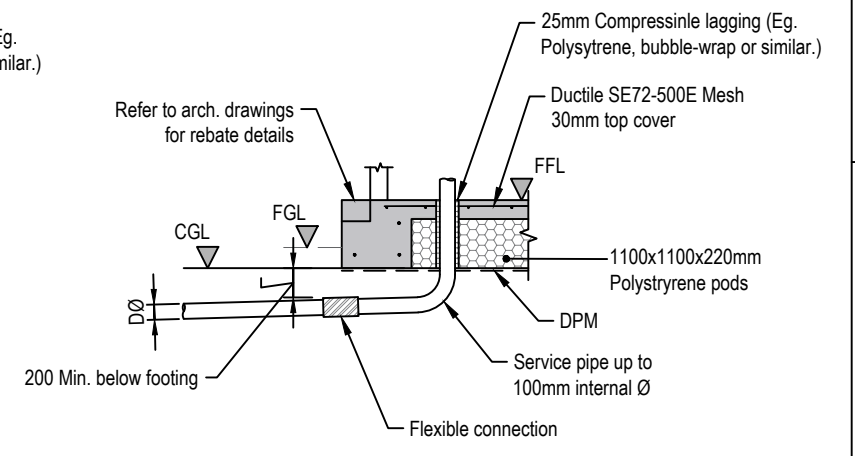
B1 TYPICAL GULLY TRAP TO FOUNDATION
Scale 1:50



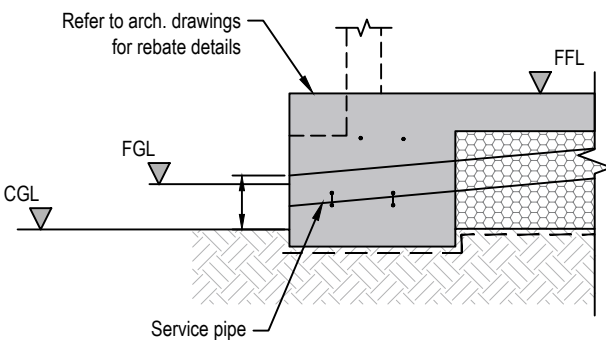
B2 TRENCH TO SLAB EDGE DISTANCE
Scale 1:50



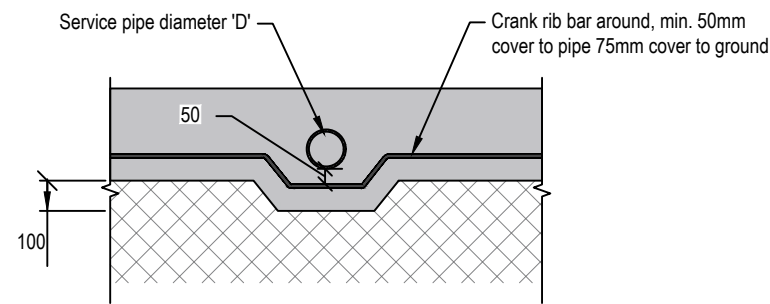
B3 TYPICAL SECTION AT EDGE
Scale 1:50



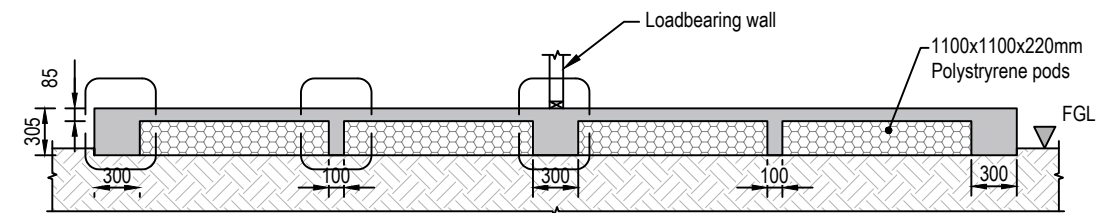
B4 TYPICAL SERVICE PIPE TO FLEXIBLE CONNECTION
Scale 1:50



C1 TYPICAL PIPE AT FOUNDATION EDGE
Scale 1:25



C2 TYPICAL PIPE PENETRATION AT FOUNDATION EDGE
Scale 1:25



D1 TYPICAL SECTION
Scale 1:50

NOTE * : * INSULATION BETWEEN DPM AND UNDERSIDE OF SLAB AS PER ARCHITECTURAL DRAWINGS AND SHEET FT07

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
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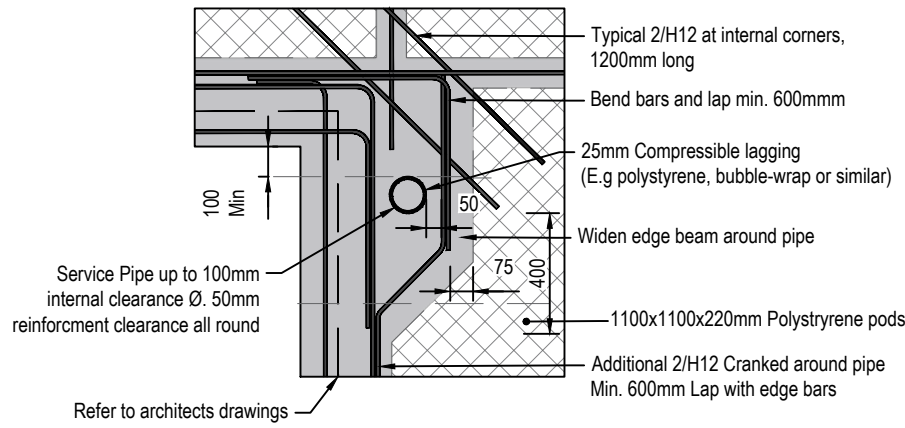
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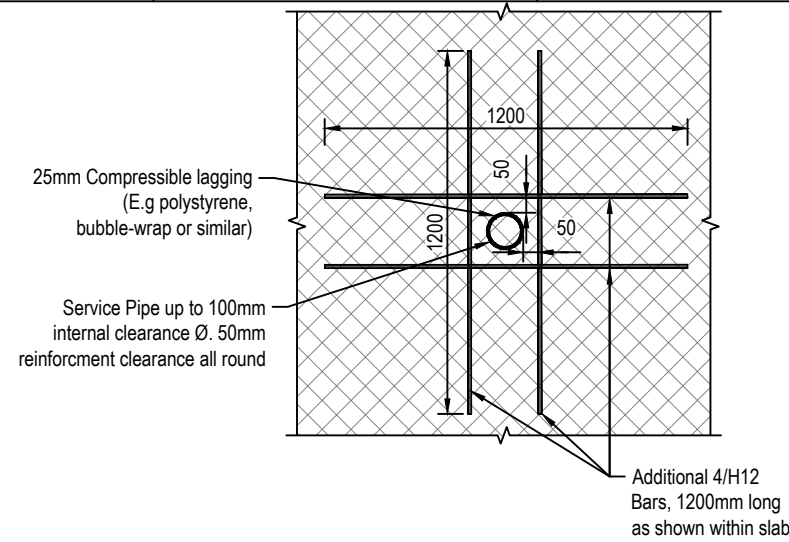
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Project Title: HUGH JOHNSTONE 142 KONINI ROAD, AUCKLAND - SED

Sheet Title: WAFFLE SLAB FOUNDATION DETAILS SHEET 03

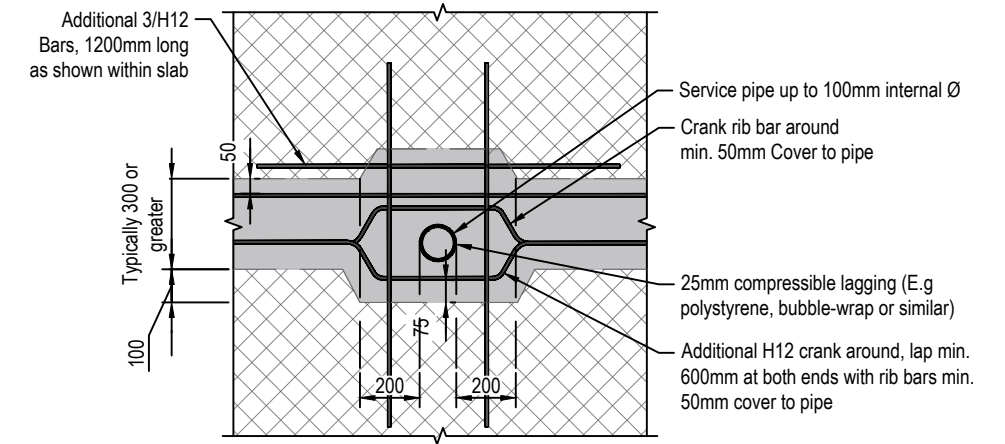
Job #: 24106
Scale (A3 Original): As Shown
Client Drawing #: FT03
Sheet #: FT03
Rev No: 01



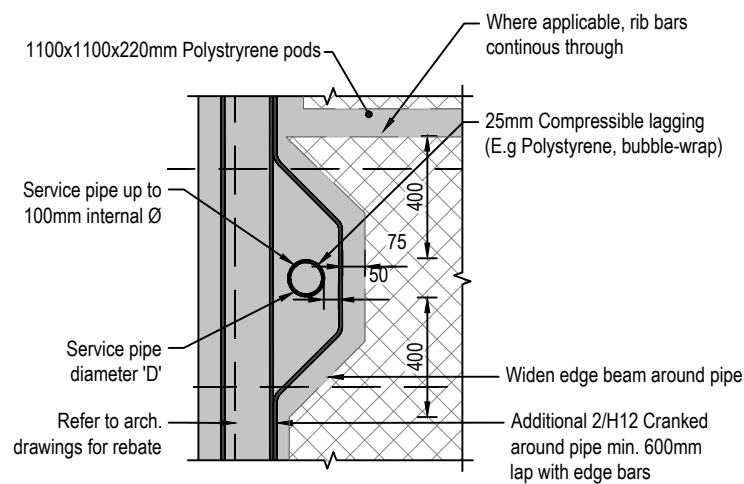
A1 TYPICAL PLAN VIEW: AT CLOSED EDGE
Scale 1:25



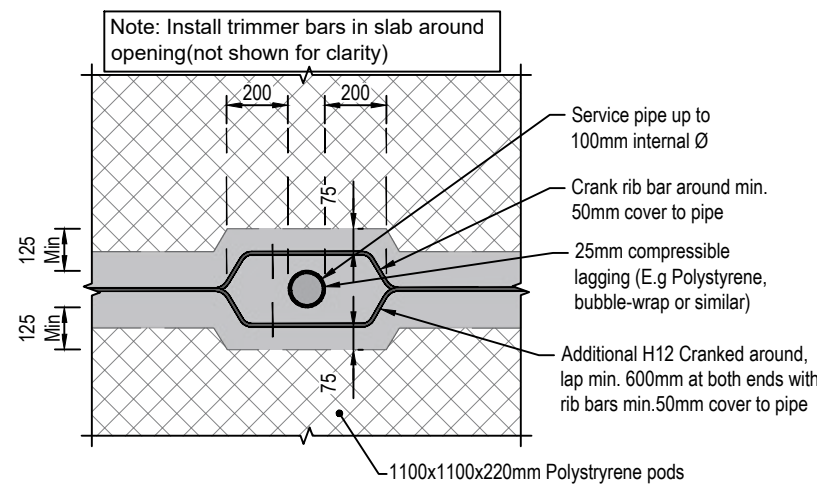
A2 TYPICAL SECTION PLAN: ABOVE POD
Scale 1:25



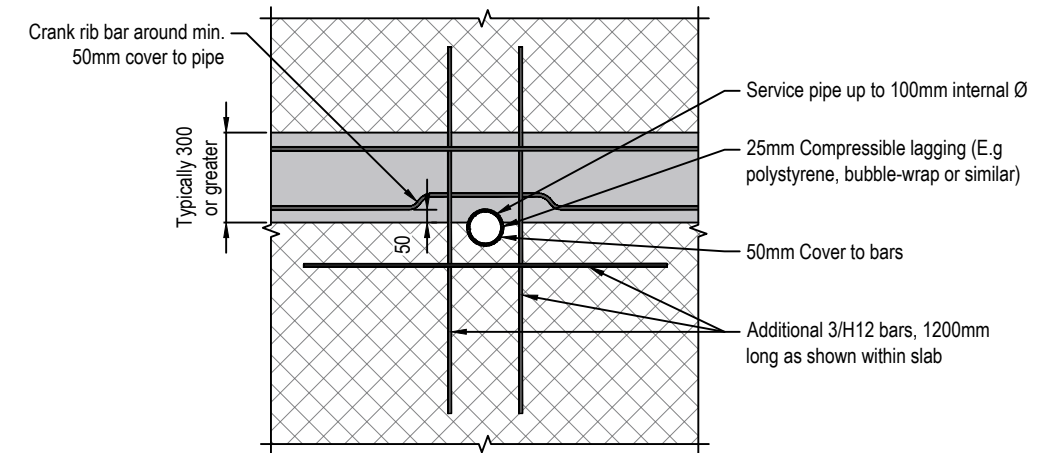
A3 TYPICAL SECTION VIEW: FOR THICKENING
Scale 1:25



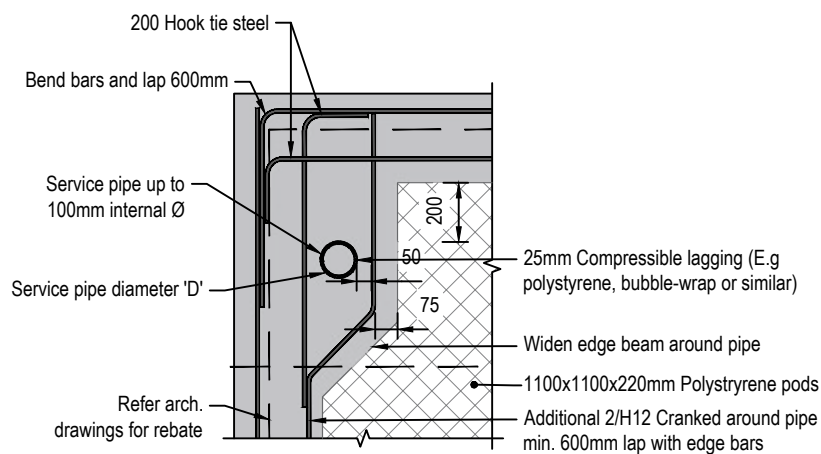
B1 TYPICAL SECTION VIEW: AT EDGE
Scale 1:25



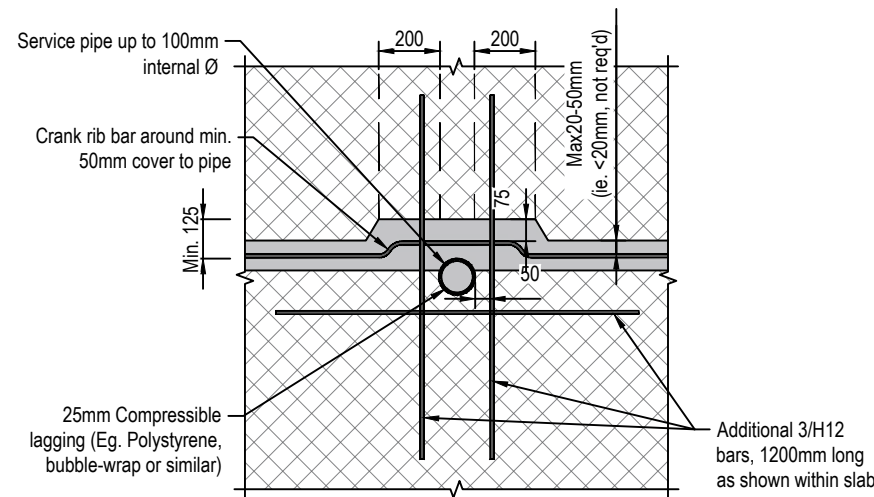
B2 TYPICAL SECTION VIEW: FOR RIB
Scale 1:25



B3 TYPICAL SECTION VIEW: ABOVE POD
Scale 1:25



C1 TYPICAL SECTION VIEW: AT OPEN CORNER
Scale 1:25



C2 TYPICAL SECTION VIEW: ABOVE POD
Scale 1:25

| | | | | | |
|--|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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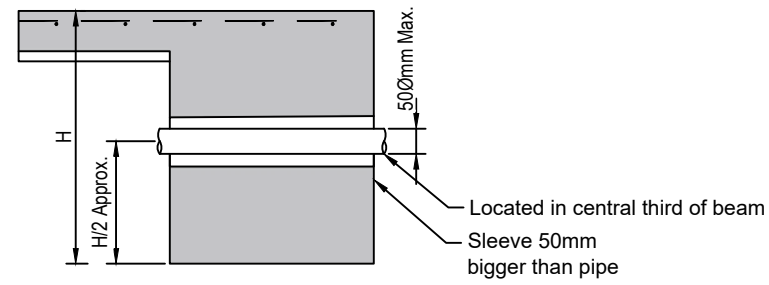
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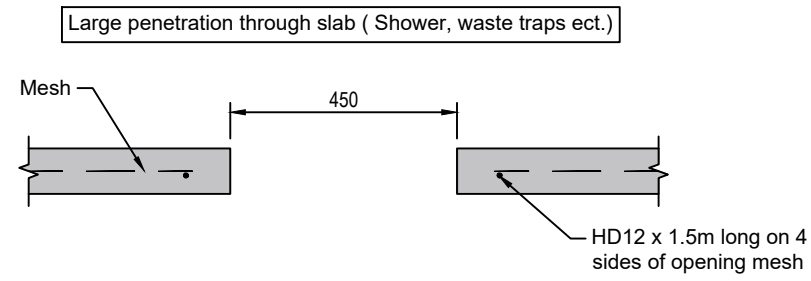
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Sheet Title:
WAFFLE SLAB FOUNDATION
DETAILS SHEET 04

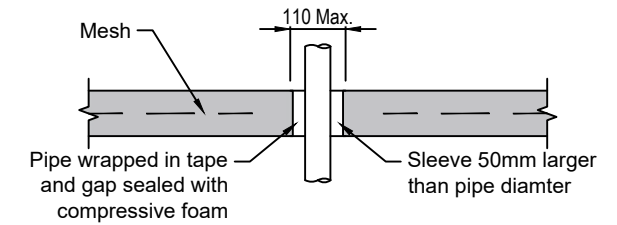
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| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | FT04 | Sheet #: | 01 |



D1 TYPICAL DETAIL: PIPE PENETRATION IN RIB
Scale 1:15



D2 TYPICAL DETAIL: LARGE PENETRATION THROUGH SLAB
Scale 1:15



D3 TYPICAL DETAIL: SMALL PENETRATION THROUGH SLAB
Scale 1:15

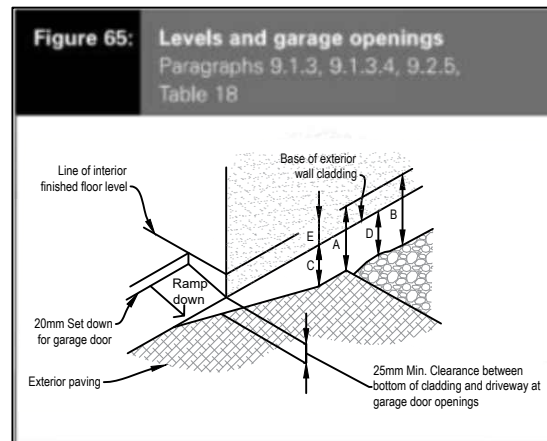
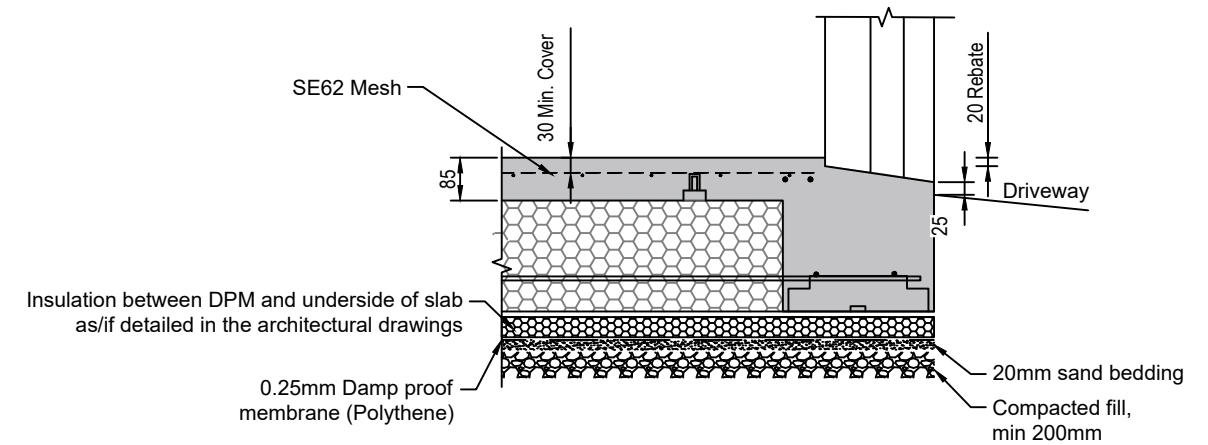


Table 18: Minimum clearances
Paragraphs 9.1.3, 9.1.3.1, 9.1.3.2, 9.1.3.3, 9.1.3.4, 9.1.3.5 and 9.2.7

| Minimum clearances (mm) | Masonry veneer | | Other claddings | | | | |
|-----------------------------------|----------------|-----|-----------------|-----|-----|-----|------------------|
| | A | B | A | B | C | D | E |
| Concrete slab | 100 | 150 | 150 | 225 | 100 | 175 | 50 |
| Timber floor Refer Note 1) | | | | | 100 | 175 | 50 ²⁾ |

NOTE: 1) Refer to NZS 3604 for requirements.
2) Cladding to extend minimum 50 mm below bearer or lowest part of timber floor framing.

Min. 25mm clearance between bottom of cladding and driveway



A3 TYPICAL DETAIL: GARAGE DOOR SECTION
Scale 1:15

| | | | | | |
|----------------|-----|------------------|-------------|---------------|--|
| Surveyed: LOSC | | | | | |
| Designed: PW | | | | | |
| Drawn: JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 | |
| Checked: PW | Rev | Revision Details | Approved by | Date | |

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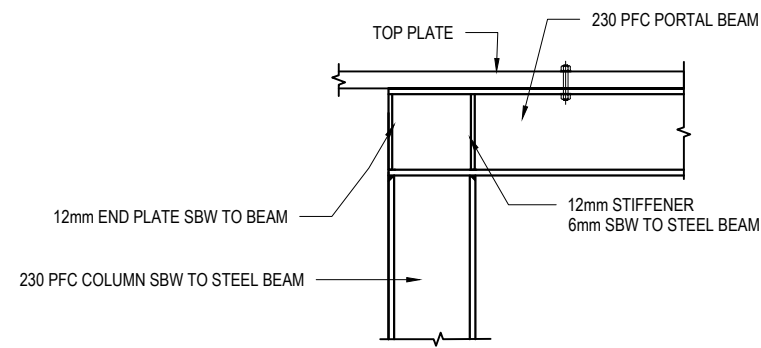
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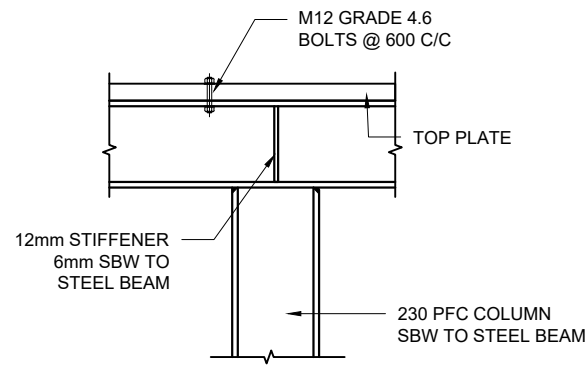
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Project Title:
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Sheet Title:
WAFFLE SLAB FOUNDATION
DETAILS SHEET 05

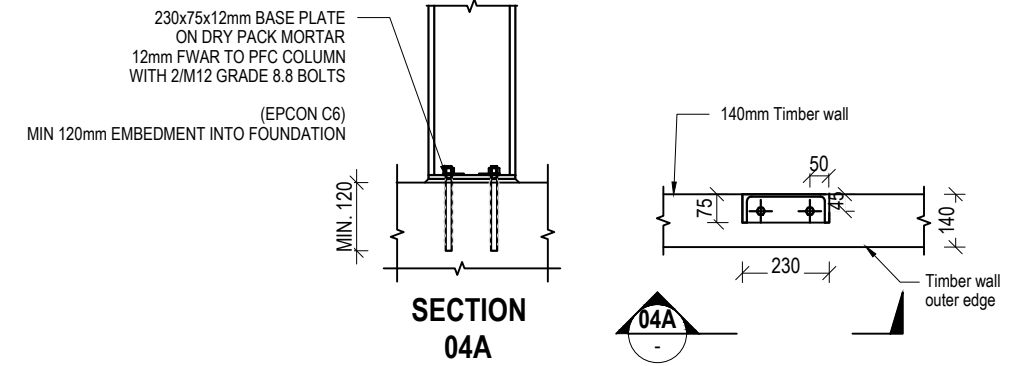
Job #: 24106
Scale (A3 Original): As Shown
Client Drawing #: FT05
Sheet #: FT05
Rev No.: 01



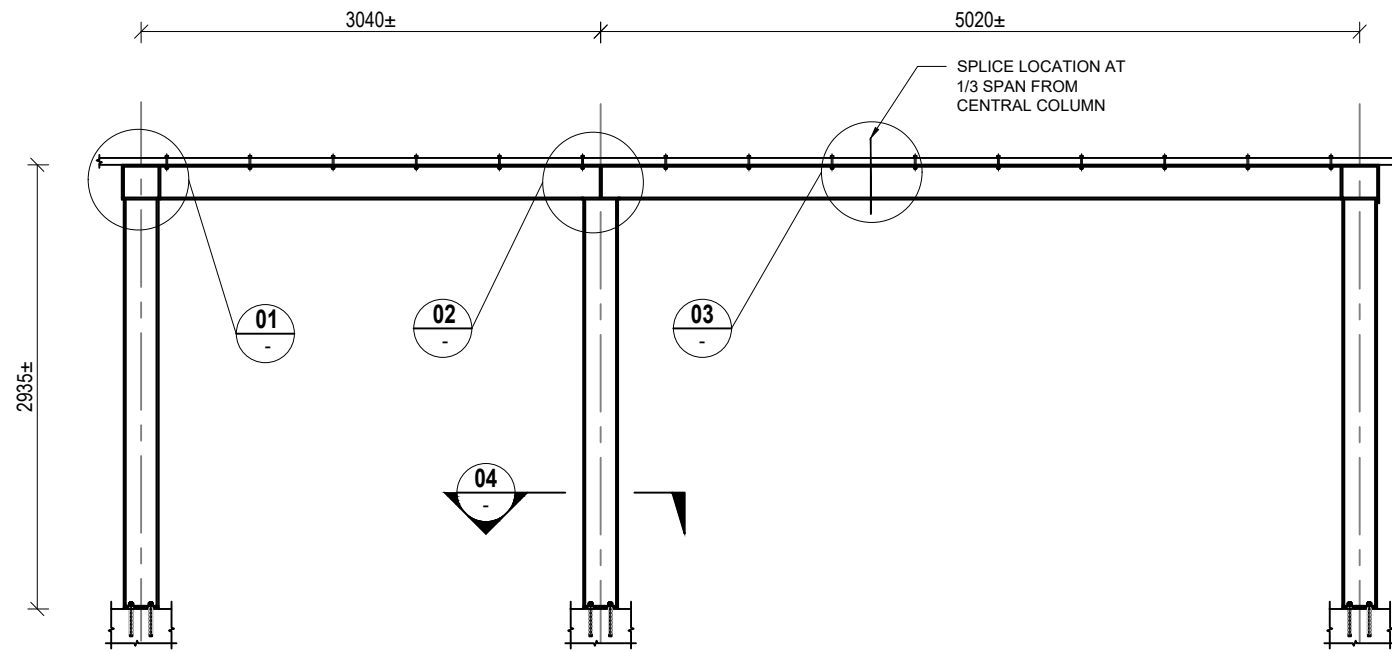
01 COLUMN TO BEAM CONNECTION DETAIL
Scale 1:20



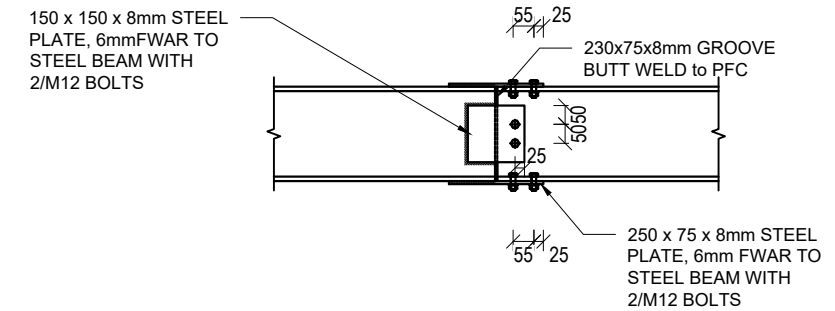
02 CENTRAL COLUMN TO BEAM CONNECTION DETAIL
Scale 1:20



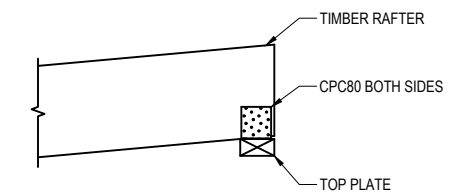
04 PORTAL COLUMN TO FLOOR CONNECTION DETAIL
Scale 1:20



A PFC PORTAL DETAIL
Scale 1:50



03 PFC SPLICE CONNECTION DETAIL
Scale 1:20



05 RAFTER CONNECTION DETAIL
Scale 1:20

NOTE:

- DIMENSIONS ARE TO BE CROSS-REFERENCED WITH ARCHITECTURAL DRAWINGS. ARCHITECTURAL DRAWINGS TAKE PRECEDENCE OVER STRUCTURAL DRAWINGS, INCLUDING THE PORTALS HEIGHTS AND SPANS.
- THE STEEL MEMBERS TO BE CONSTRUCTION CATEGORY 2, CORROSIVE CATEGORY C3 AND COATING IZS4.

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | FEBRUARY 2025 |
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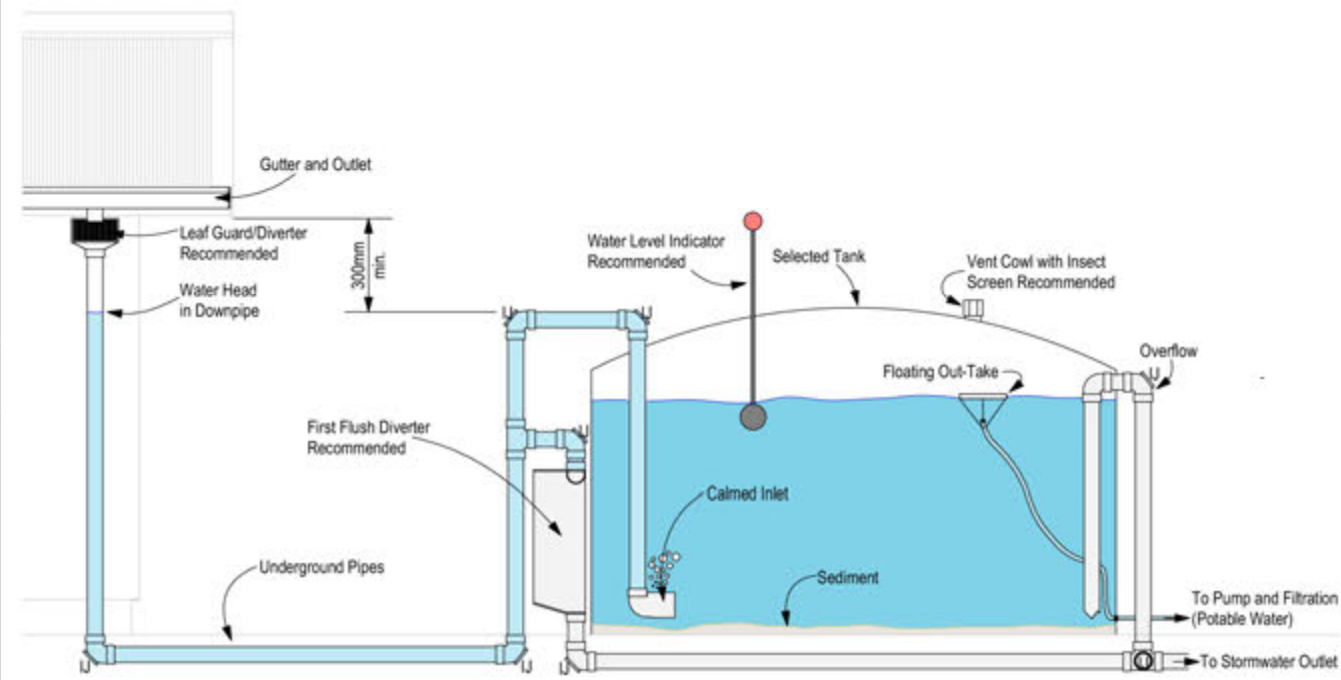
Sheet Title:
PFC PORTAL, CONNECTION
DETAILS AND RAFTER DETAIL

Job #:
24106

Client Drawing #:
S01

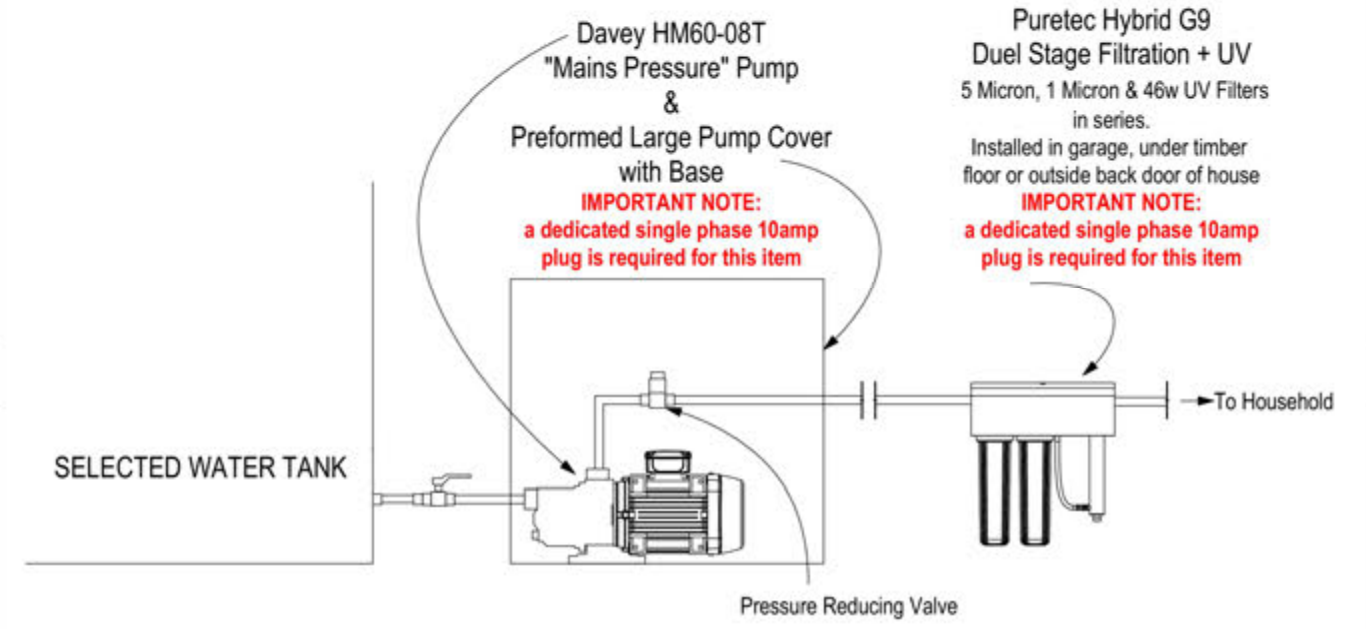
Scale (A3 Original):
As Shown

Rev No:
01



01

TYPICAL "WET" RAIN WATER TANK SETUP



02

PUMPING AND FILTERING WATER
BOPRC Requirements

| | | | | | |
|--|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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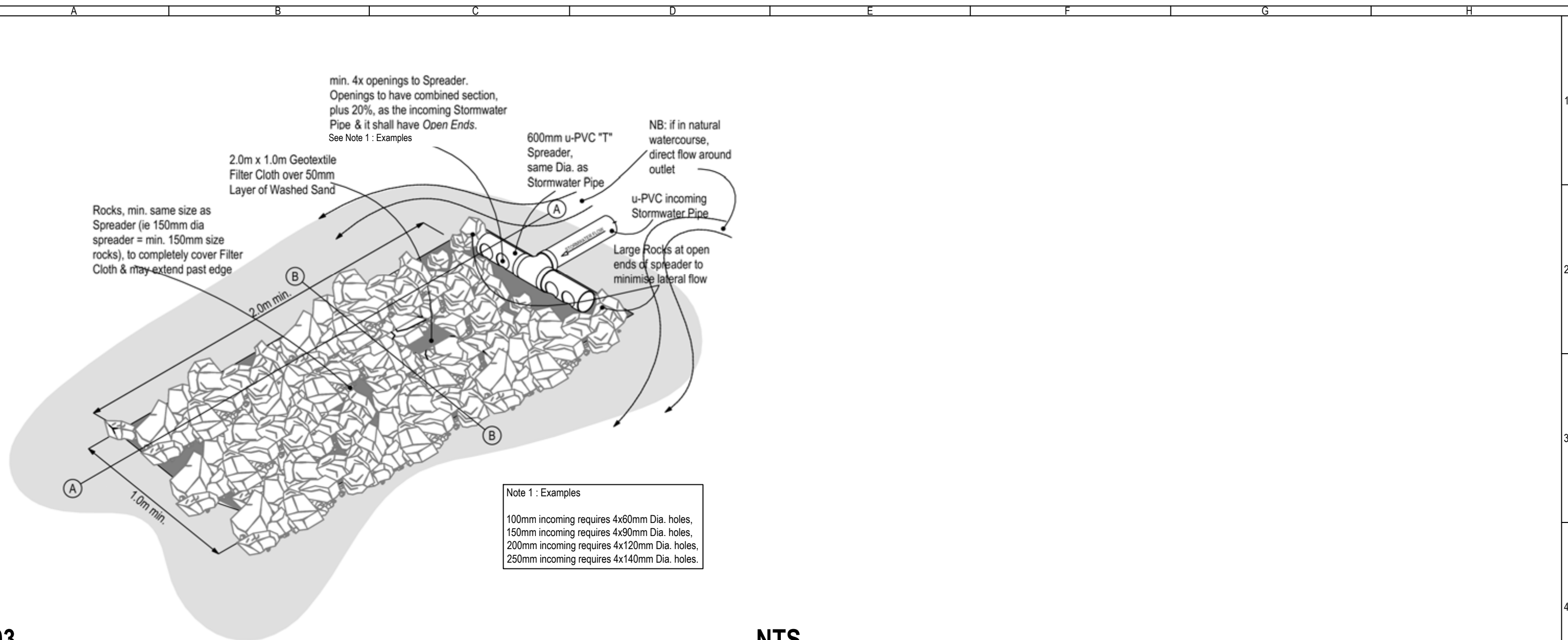
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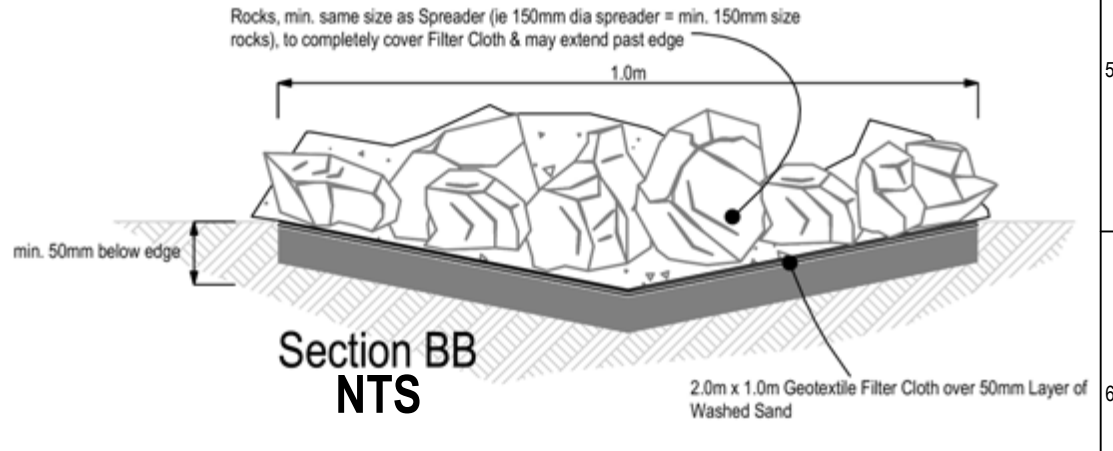
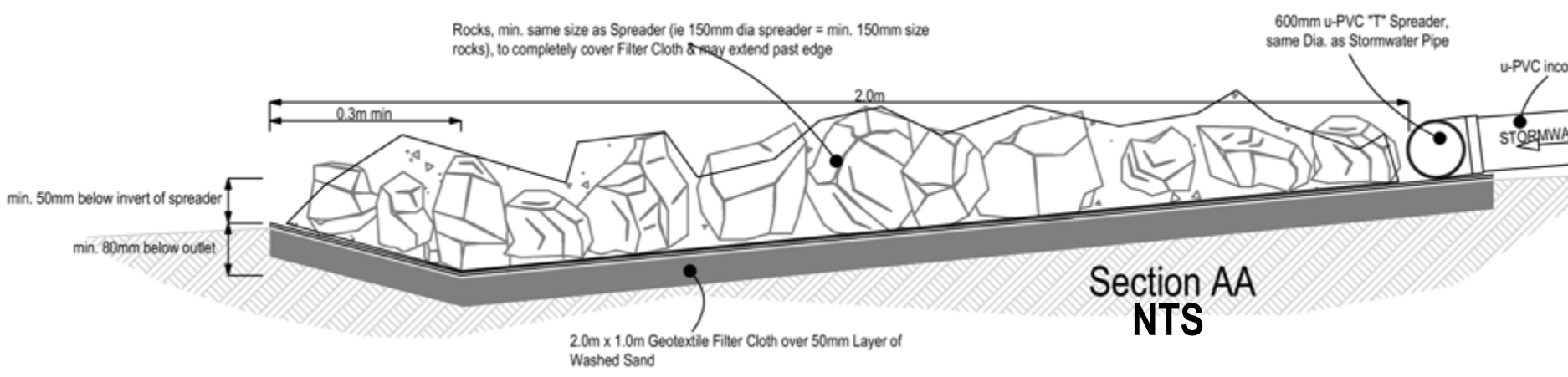
Sheet Title:
RAIN-WATER TANK DETAILS

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | SW01 | Sheet #: | 01 |
| Rev No.: | | | |



03

NTS



| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
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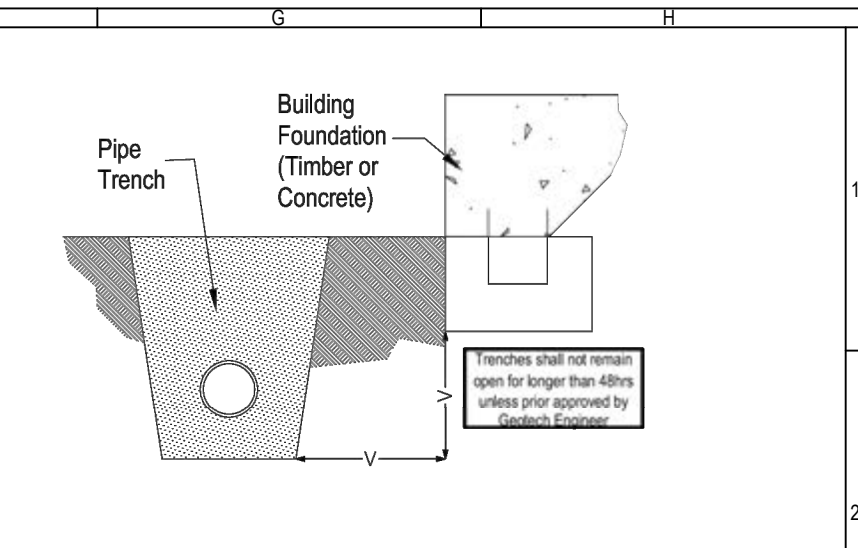
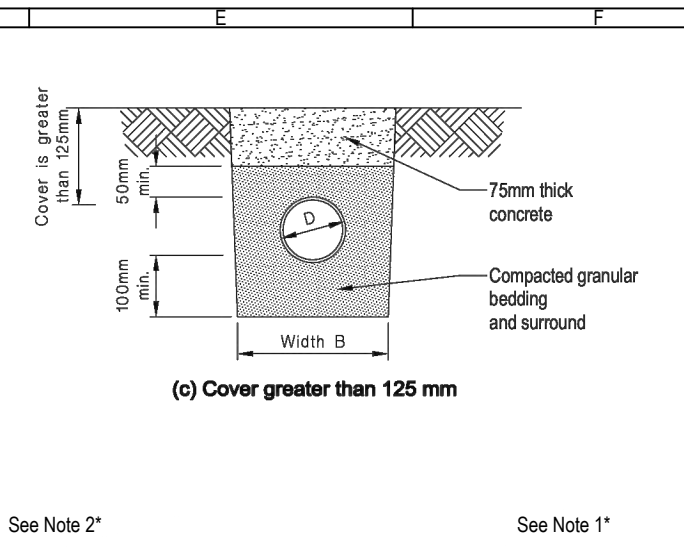
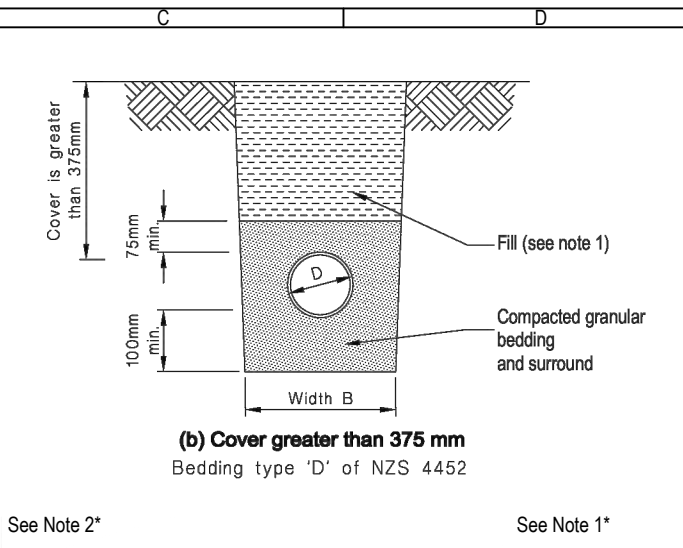
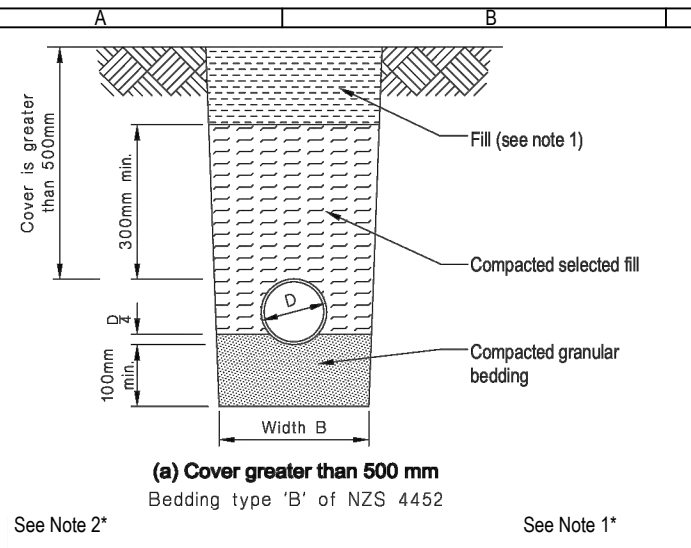
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Sheet Title: RAIN-WATER TANK FILTRATION SYSTEM

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | SW02 | Sheet #: | 01 |

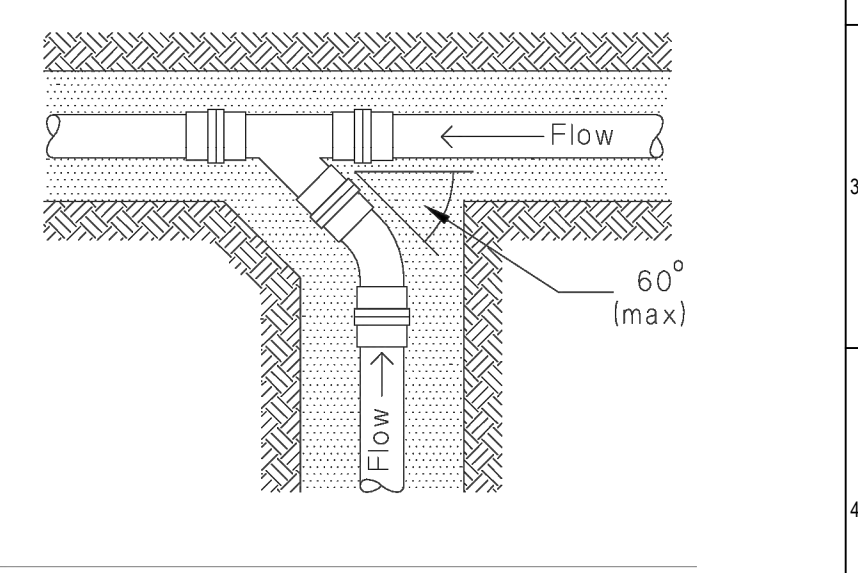
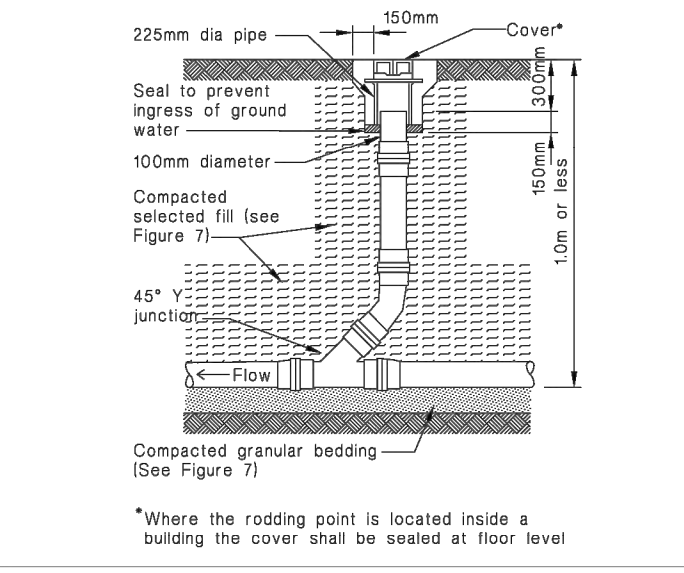
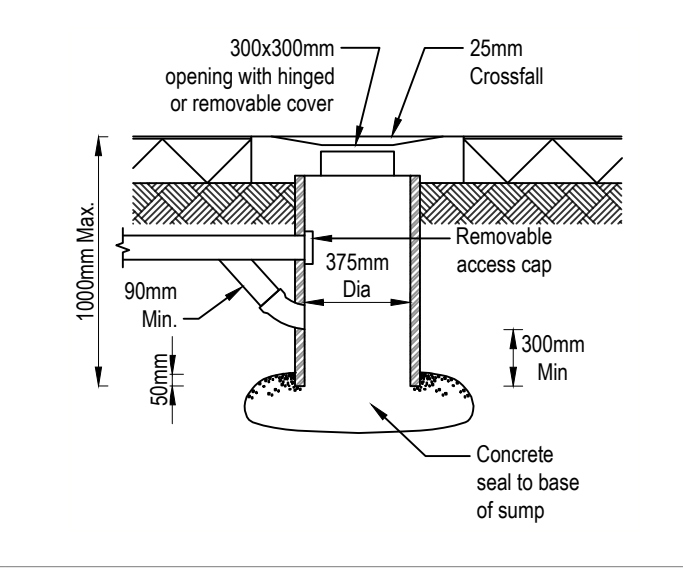
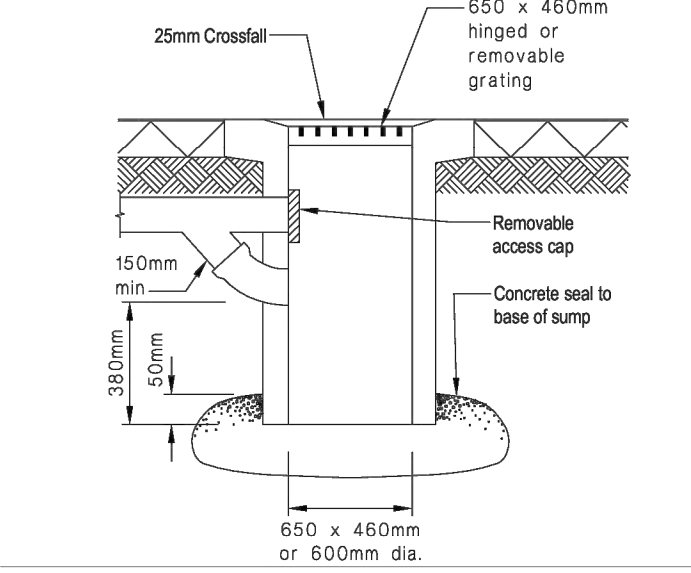


01 **TRENCH BEDDING AND BACKFILL (a)** **NTS**
E1/AS1

02 **TRENCH BEDDING AND BACKFILL (b)** **NTS**
E1/AS1

03 **TRENCH BEDDING AND BACKFILL (c)** **NTS**
E1/AS1

04 **TRENCH TO BUILDING FOUNDATION** **NTS**
E1/AS1



05 **TYPE 2 SURFACE WATER SUMP** **NTS**
E1/AS1

06 **TYPE 1 SURFACE WATER SUMP** **NTS**
E1/AS1

07 **TYPICAL RODDING POINT** **NTS**
E1/AS1

08 **CONNECTION OF DRAIN - HORIZONTAL** **NTS**
E1/AS1

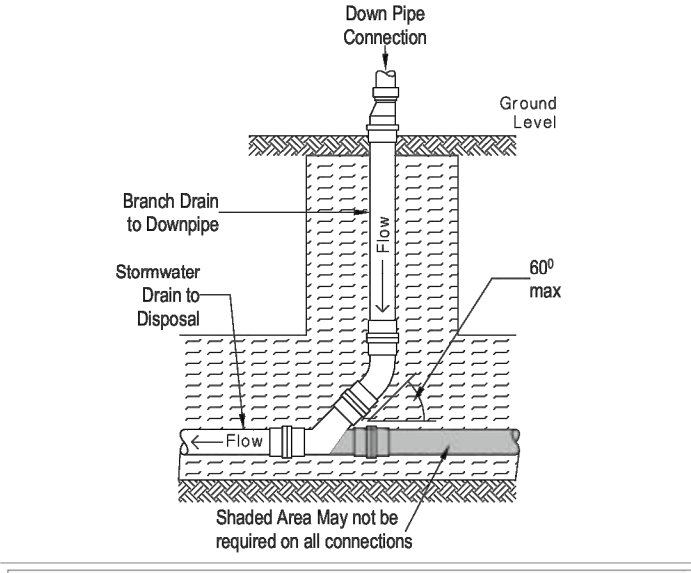


Table 2: Minimum Gradients
Paragraph 3.4.1

| Drain internal diameter | Minimum gradient |
|-------------------------|------------------|
| 85 mm | 1 in 90 |
| 100 mm | 1 in 120 |
| 150 mm | 1 in 200 |
| 225 mm | 1 in 350 |

Note 1: Fill shall be:

- Ordinary fill where drains are located below gardens and open country
- Compacted certified fill where drains are located below residential driveways, walkways, or other similar areas

Note 2:

"Width B" of the trench shall be no less than the pipe diameter D plus 200 mm. Trench width at the top of the pipe shall be no more than 600 mm unless the pipe(s) in the trench are covered with concrete.

09 **CONNECTION OF DRAIN - VERTICAL** **NTS**
E1/AS1

10 **PIPE SIZES AND FALLS** **NTS**
E1/AS1

| | | | | | |
|----------------|-----|------------------|-------------|---------------|--|
| Surveyed: LOSC | | | | | |
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| Drawn: JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 | |
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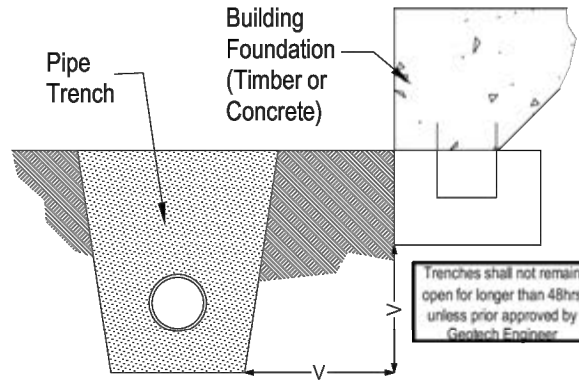
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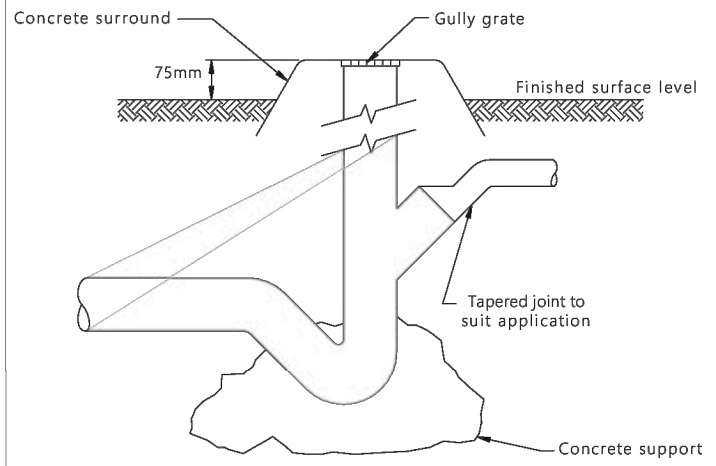
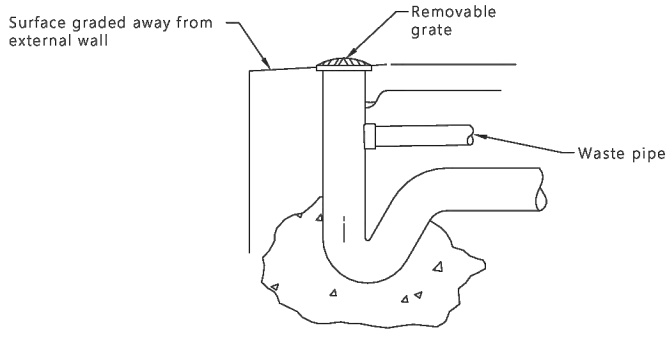
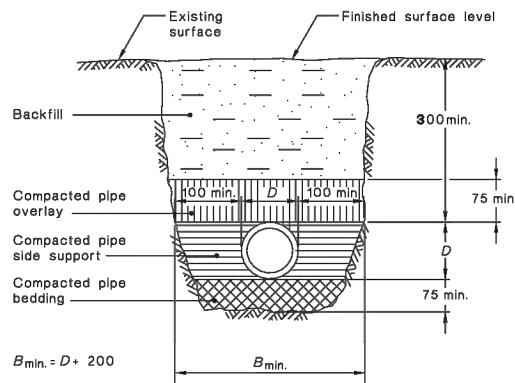
Sheet Title:
 STORMWATER DRAINS AND TRENCHES

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | SW03 | Sheet #: | 01 |



LEGEND:

 Backfill
 Pipe overlay
 Pipe side support
 Bed zone

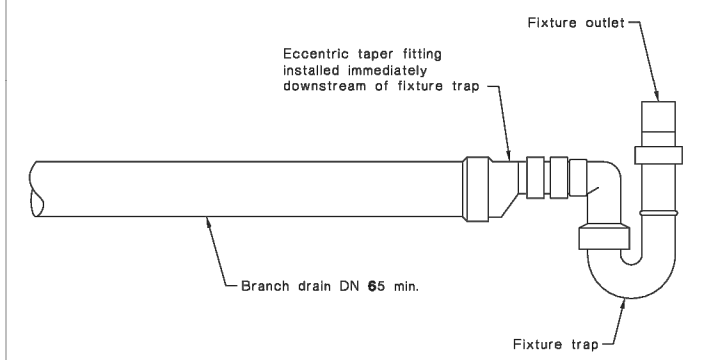
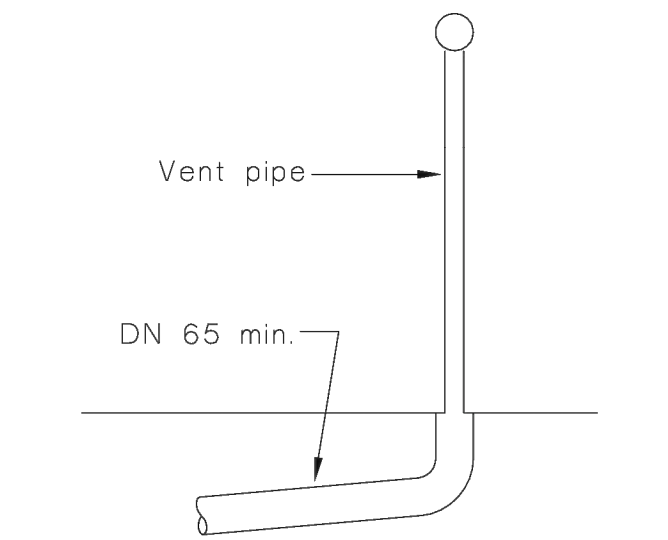
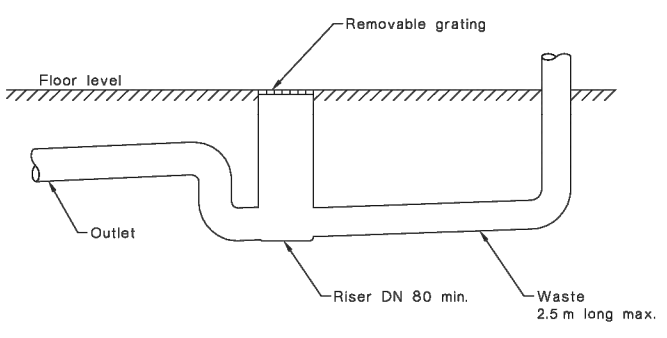
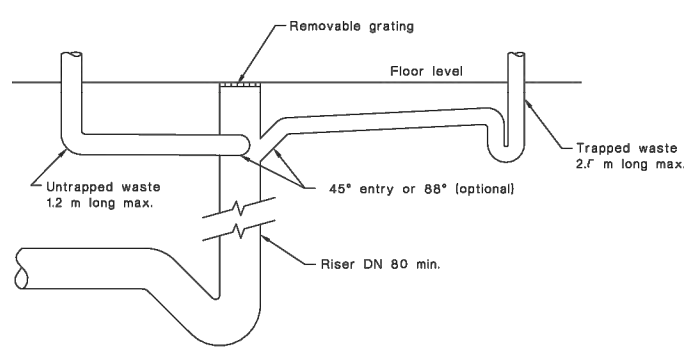


01 TRENCH TO BUILDING FOUNDATION AS/NZS3500 **NTS**

02 TRENCHS TYPICAL AS/NZS3500 **NTS**

03 TYPICAL OVERFLOW RELIEF GULLY ON PAVED SURFACE AS/NZS3500 **NTS**

04 TYPICAL OVERFLOW RELIEF GULLY ON UNPAVED SURFACE AS/NZS3500 **NTS**



05 TYPICAL FLOOR WASTE GULLY AS/NZS3500 **NTS**

06 TYPICAL SUBMERGED FLOOR WASTE GULLY AS/NZS3500 **NTS**

07 TYPICAL VENT PIPE CONNECTION AS/NZS3500 **NTS**

08 TYPICAL TRAP TO BRACH AS/NZS3500 **NTS**

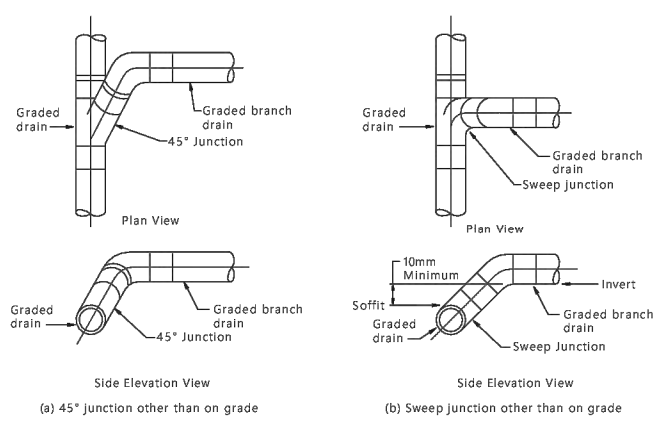
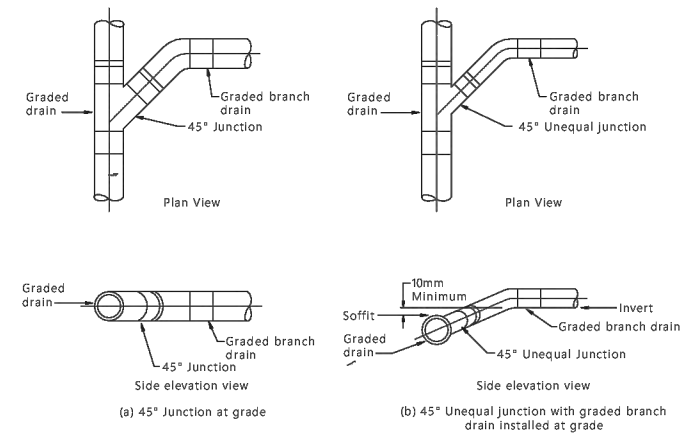


TABLE 4.11.1
 MINIMUM GRADES OF DRAINS

| Nominal size DN | Minimum grade, % |
|-----------------|------------------|
| 65 | 2.50 (1 in 40) |
| 80 | 1.65 (1 in 60) |
| 100 | 1.65 (1 in 60) |
| 125 | 1.25 (1 in 80) |
| 150 | 1.00 (1 in 100) |

09 CONNECTION OF DRAIN - ON GRADE AS/NZS3550 **NTS**

10 CONNECTION OF DRAIN - NOT ON GRADE AS/NZS3550 **NTS**

10 TYPICAL MINIMUM GRADES OF DRAINS AS/NZS3550 **NTS**

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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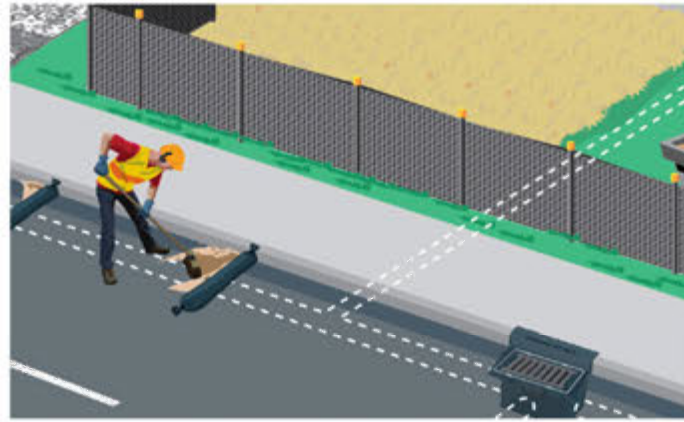
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 Project Title: HUGH JOHNSTONE 142 KONINI ROAD, AUCKLAND - SED

Sheet Title: G13/AS3 DRAINS AND TRENCHES

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | SW04 | Sheet #: | 01 |



- How?**
- Retain as much vegetation cover as possible.
 - Do your work in stages.
 - Use mulch, hay, pea straw or other material to cover exposed areas.
 - Keep a berm of grass around the outside of the site to keep hold of water and allow another layer of filtration.
 - Revegetate exposed areas as rapidly as possible.
- Why?**
- Uncovered areas can be easily eroded.
 - The less soil that is exposed, the less that can be washed away.



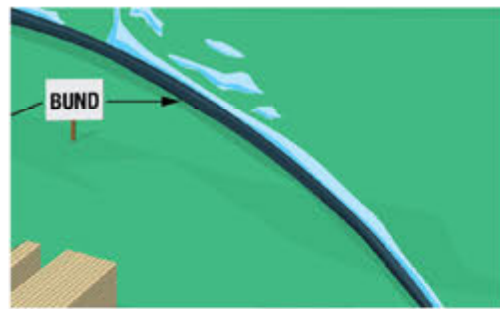
- How?**
- Cover stockpiles with mulch, straw or a tarpaulin as soon as practicable to prevent soil loss.
 - Soil and other materials should be stockpiled away from kerbs and areas where run-off may enter the stormwater system or drains.
 - Use a silt fence around a stockpile or on the downhill side of the stockpile to contain sediment.
 - Avoid locating a stockpile in a low-lying area which may form part of the natural drainage pattern of the site.
- Why?**
- Exposing soil stockpiles to rainfall can result in surface run-off.
 - Uncovered soil can be blown off the site.
- Maintenance**
- Check after each rainfall event.

01 **Minimize Exposed Areas**
Sediment and erosion control guideline

NTS

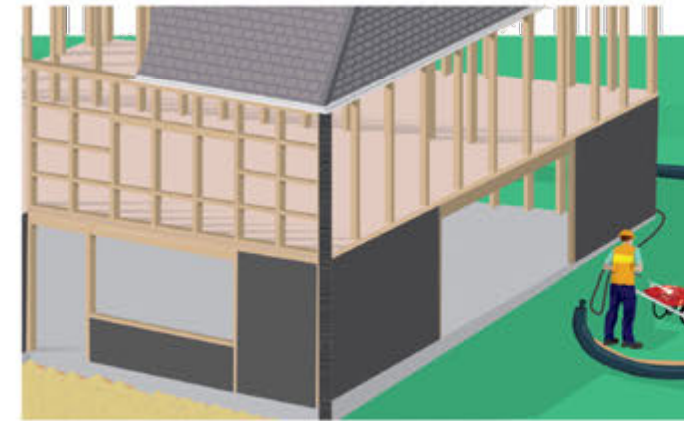
02 **Manage Stockpiles**
Sediment and erosion control guideline

NTS



- How?**
- Create a diversion channel or contour drain above the earthworks on the site so clean water does not enter the work area.
 - Ensure sediment-laden water from the works area is channelled to an appropriate area where it can be retained onsite.

- Why?**
- Left unmanaged, dirty water will contaminate clean water and increase the amount of treatment control devices required to prevent sediment leaving the site.
 - Divert clean rainwater away from your exposed worksite to prevent it from dislodging sediment.
 - Prevent diverted water from adversely affecting neighbouring properties or public areas.
- Maintenance**
- Ensure diversion channels and bunds have not been eroded by rainfall.
 - Remove accumulated sediment from retention area.



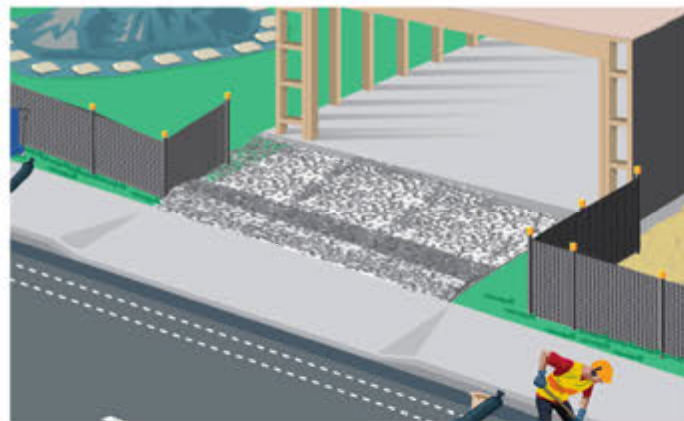
- How?**
- Use temporary downpipes once you have installed your roof and gutters.
 - Alternatively, non-erosive, temporary ground cover shall be placed under downpipes to prevent splash erosion and divert water to turfed areas on the site.
- Why?**
- Installing drainage early enables you to remove clean water from your site – keeping clean water clean.
 - Reduces the amount of water requiring treatment.
- Maintenance**
- Regularly check that the temporary downpipes are securely fastened before and after rainfall events.

03 **Clean Water Diversion**
Sediment and erosion control guideline

NTS

04 **Connection to Stormwater System**
Sediment and erosion control guideline

NTS



- How?**
- A minimum entranceway should:
 - have a 150mm thick layer of 65-100mm aggregate
 - be long enough for your site with "wings" (to allow for vehicles cutting corners)
 - be 4m minimum width, with 1.5m wide "wings" on either side to cater for larger delivery vehicles
 - Use large washed aggregate.
 - Do not use materials such as sand, crushed concrete or asphalt to make your entranceway as they are not effective.
- Why?**
- A stabilised entrance way will enable vehicles to be kept off exposed soil and clay.
 - A stabilised entrance way is required to prevent vehicles tracking mud and clay onto the road (which is a common source of complaints to Council).
 - Soil and contaminants can be washed directly off your site onto the road making it slippery and dangerous. They can then enter the stormwater system by rain or create a dust nuisance in dry weather.

- Maintenance**
- Inspect weekly and after each rainfall event.
 - Maintain the stabilised driveway to prevent sediment from leaving the construction site.
 - Remove sediments from sealed pavements by sweeping. Do not use a water truck to wash the road as this will wash any sediment into the stormwater system.
 - Soil or other aggregate material should be swept back onto the site and not onto the road.

05 **Stabilise Construction Entranceway**
Sediment and erosion control guideline

NTS

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|--|------|-----|------------------|-------------|---------------|
| Surveyed: | LOSC | | | | |
| Designed: | PW | | | | |
| Drawn: | JLB | 01 | FOR CONSENT | PW | NOVEMBER 2024 |
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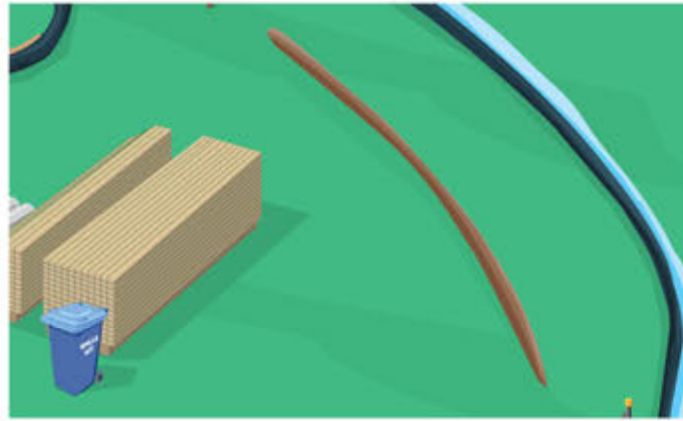
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Client:
HUGH JOHNSTONE
Project Title:
HUGH JOHNSTONE 142
KONINI ROAD, AUCKLAND -
SED

Sheet Title:
GENERAL SEDIMENT CONTROL
SHEET 01

Job #:
24106
Scale (A3 Original):
As Shown
Client Drawing #:
EC01
Sheet #:
01
Rev No:



- How?**
- Construct a compacted earth bund around the outer edges of your site.
 - Construct a bund through compacting clay or topsoil and cover them with geotextile cloth.
- Why?**
- Earth bunds will divert clean rainwater from the exposed works and provide a barrier for the retention of dirty water allowing sediment to settle out.
- Maintenance**
- Earth bunds need to be checked regularly throughout the build to ensure they are still providing an effective barrier.
 - Soil needs to be recompact to provide an effective barrier should damage occur.



- Regularly check and systematically carry out audits to ensure the controls onsite are maintained to the appropriate standard.
- Be ready to alter your site controls as the site or conditions change.
- Create a checklist to ensure all appropriate measures are in place on the site.
- Continue to educate staff and share ideas on how to maintain sediment and erosion controls on your site.
- Work as a team to get it right and take pride in doing your part in protecting our environment and region.

01 Earth Bunds Retain Soil and Prevent Run-off
Sediment and erosion control guideline

NTS

02 Manage Stockpiles
Sediment and erosion control guideline

NTS



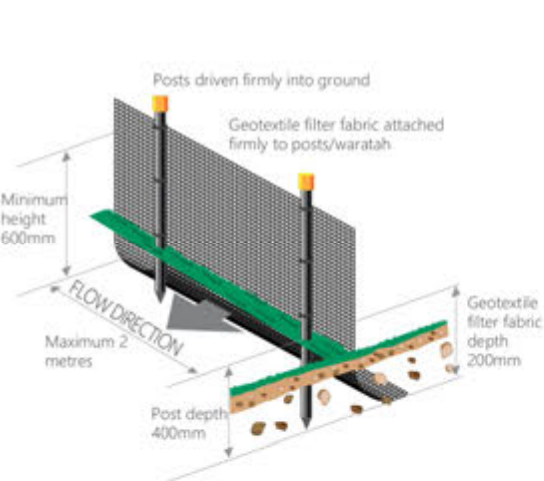
Drain/catchpit protection should not be used as your only means of control. Talk to your compliance officer about what option would best suit your site.

- How?**
- When installing catchpit controls:
- Protection measures should be installed before works start.
 - Ensure the filter cloth covers the extent of the grate and the inlet at the back.
 - Install a series of sand socks in the kerb and channel before the catchpit to intercept the stormwater – this will slow the velocity of the water allowing more sediment to settle out of the water.
 - Remember to remove the filter cloth after you have completed your project.

- Why?**
- Catchpit/drain protection measures are placed within or around stormwater inlets to intercept sediment-laden run-off before it enters the Council's stormwater system.
 - Drain or catchpit protection should only be considered as your secondary protection and is designed to assist your primary site controls such as a bund or silt fence.
- Maintenance**
- Ensure that your catchpit protection remains effective by checking it once a week and following large rain events.

03 Drain/Catchpit Protection
Sediment and erosion control guideline

NTS



- How?**
- Correct installation of a silt fence is critical to its performance. To be effective a silt fence needs to:
 - be installed in a trench 200mm deep by 100mm wide.
 - have waratahs or posts hammer-staked at least 400mm deep on the downhill side of the fabric, no more than 2m apart.
 - be 600mm high above the ground, with an additional 200mm of cloth below ground in the trench.
 - have each end of the fence return up the slope by roughly 2m to prevent water going around the edges.
 - be anchored by backfilling the trench and placing soil on top of the fabric.
 - it is recommended that woven 100-micron geotextile cloth is used.
 - weedmat and other materials (including tarpaulins) do not work properly as silt fences and should not be used.
- Why?**
- A silt fence is a temporary barrier used to intercept dirty water and retain sediment on site.
 - A silt fence is installed around the downhill side of your site to contain sediment – to ensure that when rainfall events occur, muddy water stays behind the fence.
 - Silt fences should be used for containing stockpiles of earth or other areas of disturbed soil or clay on your site.

- Maintenance**
- Inspect silt fences at least once a week and after a rain event. Fences should also be checked for wind damage.
 - Remove accumulated sediment to a secure area when it reaches 50% of the fabric height. This will reduce pressure and allow for adequate sediment storage.
 - Check the integrity of the fence to confirm effectiveness - replace or reinstate where required.
 - A silt fence should remain in place until the site is stabilised or the exposed area is less than 100m².
 - Where water ponds behind the fence, extra support should be provided.

04 Silt Fences
Sediment and erosion control guideline

NTS

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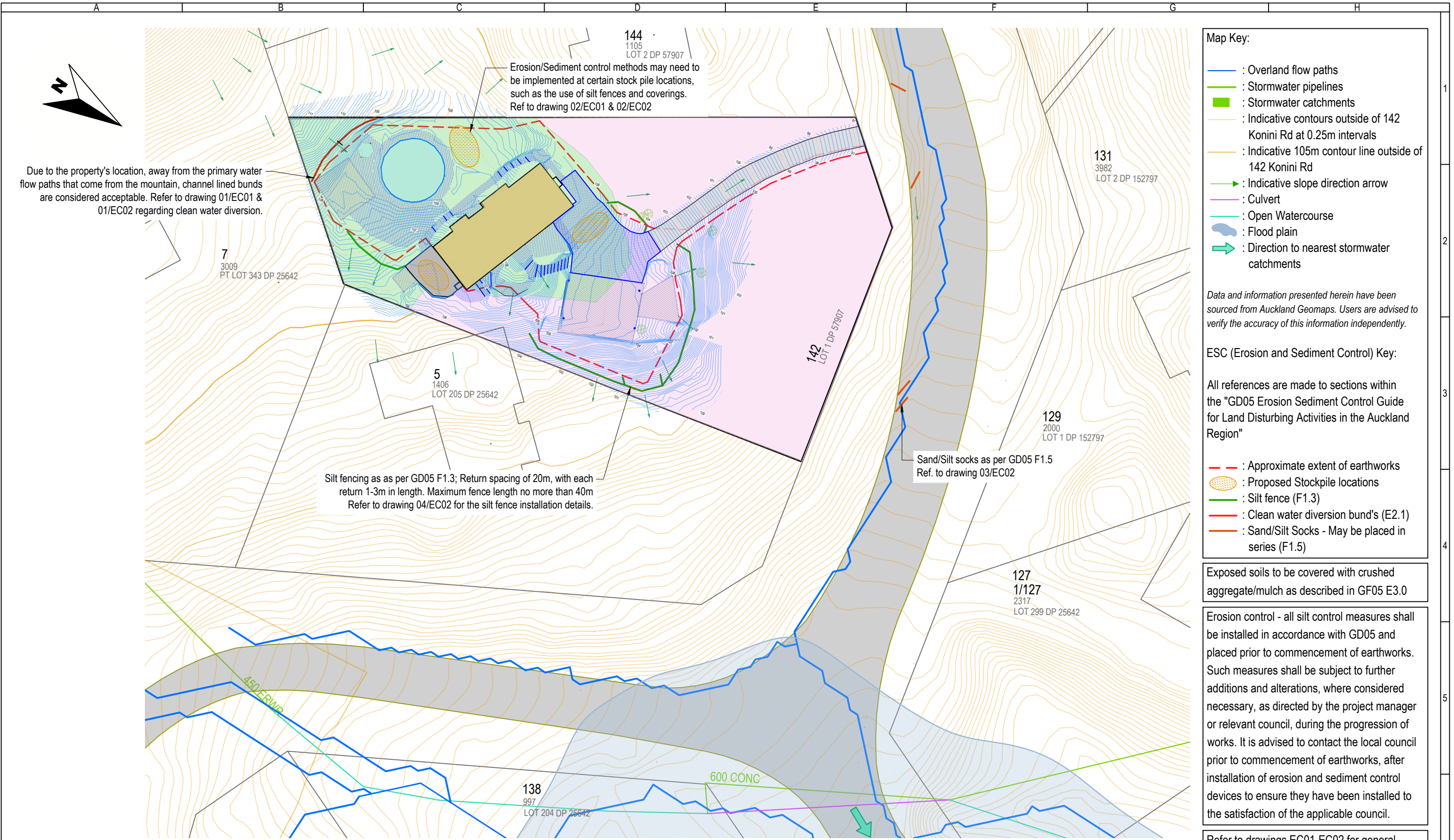
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Client:
HUGH JOHNSTONE
Project Title:
HUGH JOHNSTONE 142
KONINI ROAD, AUCKLAND -
SED

Sheet Title:
GENERAL SEDIMENT CONTROL
SHEET 02

| | | | |
|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | EC02 | Sheet #: | 01 |



Due to the property's location, away from the primary water flow paths that come from the mountain, channel lined bunds are considered acceptable. Refer to drawing 01/EC01 & 01/EC02 regarding clean water diversion.

Erosion/Sediment control methods may need to be implemented at certain stock pile locations, such as the use of silt fences and coverings. Ref to drawing 02/EC01 & 02/EC02

Silt fencing as per GD05 F1.3; Return spacing of 20m, with each return 1-3m in length. Maximum fence length no more than 40m. Refer to drawing 04/EC02 for the silt fence installation details.

Sand/Silt socks as per GD05 F1.5. Ref. to drawing 03/EC02

- Map Key:**
- : Overland flow paths
 - : Stormwater pipelines
 - : Stormwater catchments
 - : Indicative contours outside of 142 Konini Rd at 0.25m intervals
 - : Indicative 105m contour line outside of 142 Konini Rd
 - : Indicative slope direction arrow
 - : Culvert
 - : Open Watercourse
 - : Flood plain
 - : Direction to nearest stormwater catchments

Data and information presented herein have been sourced from Auckland Geomaps. Users are advised to verify the accuracy of this information independently.

ESC (Erosion and Sediment Control) Key:

All references are made to sections within the "GD05 Erosion Sediment Control Guide for Land Disturbing Activities in the Auckland Region"

- - - : Approximate extent of earthworks
- : Proposed Stockpile locations
- : Silt fence (F1.3)
- : Clean water diversion bund's (E2.1)
- : Sand/Silt Socks - May be placed in series (F1.5)

Exposed soils to be covered with crushed aggregate/mulch as described in GF05 E3.0

Erosion control - all silt control measures shall be installed in accordance with GD05 and placed prior to commencement of earthworks. Such measures shall be subject to further additions and alterations, where considered necessary, as directed by the project manager or relevant council, during the progression of works. It is advised to contact the local council prior to commencement of earthworks, after installation of erosion and sediment control devices to ensure they have been installed to the satisfaction of the applicable council.

Refer to drawings EC01-EC02 for general sediment control details

ESC EROSION & SEDIMENT CONTROL FOR EXISTING SITE: PLAN
Scale 1:400

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| Surveyed: | LOSC | | | | |
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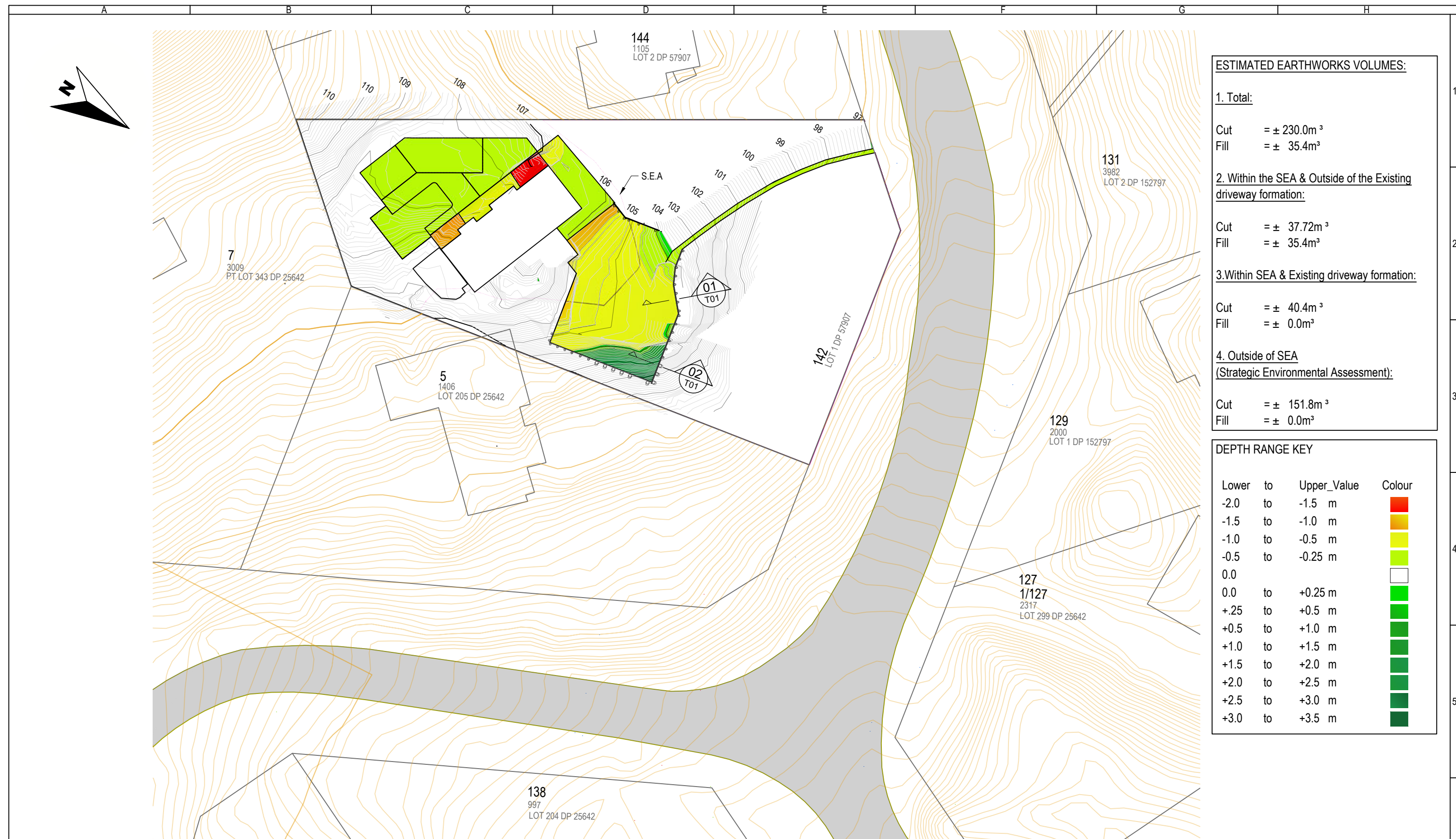
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Client: HUGH JOHNSTONE
Project Title: HUGH JOHNSTONE 142 KONINI ROAD, AUCKLAND - SED

Sheet Title: EROSION AND SEDIMENT CONTROL PLANS

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|-------------------|-------|----------------------|----------|
| Job #: | 24106 | Scale (A3 Original): | As Shown |
| Client Drawing #: | | Sheet #: | ESC |
| | | Rev No.: | 01 |



ESTIMATED EARTHWORKS VOLUMES:

1. Total:

Cut = ± 230.0m³
 Fill = ± 35.4m³

2. Within the SEA & Outside of the Existing driveway formation:

Cut = ± 37.72m³
 Fill = ± 35.4m³

3. Within SEA & Existing driveway formation:

Cut = ± 40.4m³
 Fill = ± 0.0m³

4. Outside of SEA (Strategic Environmental Assessment):

Cut = ± 151.8m³
 Fill = ± 0.0m³

DEPTH RANGE KEY

| Lower | to | Upper_Value | Colour |
|-------|----|-------------|-----------------|
| -2.0 | to | -1.5 m | Red |
| -1.5 | to | -1.0 m | Orange |
| -1.0 | to | -0.5 m | Yellow |
| -0.5 | to | -0.25 m | Light Green |
| 0.0 | | | White |
| 0.0 | to | +0.25 m | Light Green |
| +0.25 | to | +0.5 m | Green |
| +0.5 | to | +1.0 m | Dark Green |
| +1.0 | to | +1.5 m | Very Dark Green |
| +1.5 | to | +2.0 m | Dark Green |
| +2.0 | to | +2.5 m | Very Dark Green |
| +2.5 | to | +3.0 m | Dark Green |
| +3.0 | to | +3.5 m | Very Dark Green |

EARTHWORKS PLAN
 Scale 1:250

| | | | | | |
|-----------|------|-----|------------------|-------------|---------------|
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Client:
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Project Title:
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 KONINI ROAD, AUCKLAND -
 SED

Sheet Title:
 SITE EARTHWORKS PLAN

Job #:
 24106

Scale (A3 Original):
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Client Drawing #:
 ISO

Sheet #:
 01

Rev No.: